

Issue No. : Issue 1
Issue Date : April 2021
Project No. : 1825



**2021/03
MONTHLY EM&A REPORT
FOR
PORT SHELTER PHASE 3, PO
TOI O SEWERAGE
TREATMENT PLANT EM&A**

Prepared by
Allied Environmental Consultants Limited

COMMERCIAL-IN-CONFIDENCE

Allied Environmental Consultants Limited

Member of AEC Group (HKEX Stock Code: 8320.HK)

27/F, Overseas Trust Bank Building, 160 Gloucester Road, Wan Chai, Hong Kong

www.asecg.com T: +852 2815 7028 F: +852 2815 5399

沛然環境評估工程顧問有限公司

沛然環保集團成員 (港交所股份代號: 8320.HK)

香港灣仔告士打道 160 號海外信託銀行大廈 27 樓

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Certified by:


Timmy WONG
Environmental Team Leader

Verified by:


F.C. TSANG
Independent Environmental Checker

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ACUITY
SUSTAINABILITY
CONSULTING LIMITED



Website: www.acuityhk.com



Unit C, 11/F., Ford Glory Plaza,
Nos. 37-39 Wing Hong Street,
Cheung Sha Wan, Kowloon, HK



Tel. : (852) 2698 6833
Fax.: (852) 2698 9383

Our Ref: PL-202104013

Drainage Services Department
Special Duty Division
42/F, Revenue Tower, 5 Gloucester Road,
Wan Chai, Hong Kong.

Attention: Ms. Wing W.Y. Law

13 April 2021

Dear Wing,

Port Shelter Sewerage, Stage3 - Sewerage Works at Po Toi O
Monthly EM&A Report for March 2021

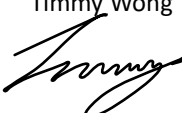
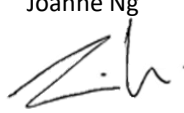

Referring to the captioned report (Issue No. 1) received on 13 April 2021, please be informed that we have no further comments on the report. We hereby verify the report as per Condition 3.4 of the Environmental Permit (No. EP-516/2016).

Yours sincerely,

F.C. Tsang
Independent Environmental Checker

Document Verification



Project Title		Port Shelter Phase 3, Po Toi O Sewerage Treatment Plant EM&A		Project No. 1825	
Document Title		2021/03 Monthly EM&A Report			
Issue No.	Issue Date	Description	Prepared by	Checked by	Approved by
1	8/4/2021	1 st Submission	Timmy Wong 	Joanne Ng 	Grace Kwok 

Allied Environmental Consultants Limited

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27/F, Overseas Trust Bank Building, 160 Gloucester Road, Wan Chai, Hong Kong

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沛然環境評估工程顧問有限公司

沛然環保集團成員 (港交所股份代號: 8320.HK)

香港灣仔告士打道 160 號海外信託銀行大廈 27 樓

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Port Shelter Phase 3, Po Toi O Sewage Treatment Plant EM&A

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1. Executive Summary

1.1 Introduction

1.1.1 This is the 1st EM&A Report prepared by Allied Environmental Consultants Limited (AEC) for the Sewage works at Po Toi O comprise sewage collection, treatment and disposal facilities at Po Toi O under Port Shelter Sewerage, Stage 3 – Sewerage Works at Po Toi O. This report summarized the monitoring results and audits findings of the EM&A programme under the issued EP (EP No.: EP-516/2016) and in accordance with the EM&A Manual during the reporting period from 01/03/2021 to 31/03/2021.

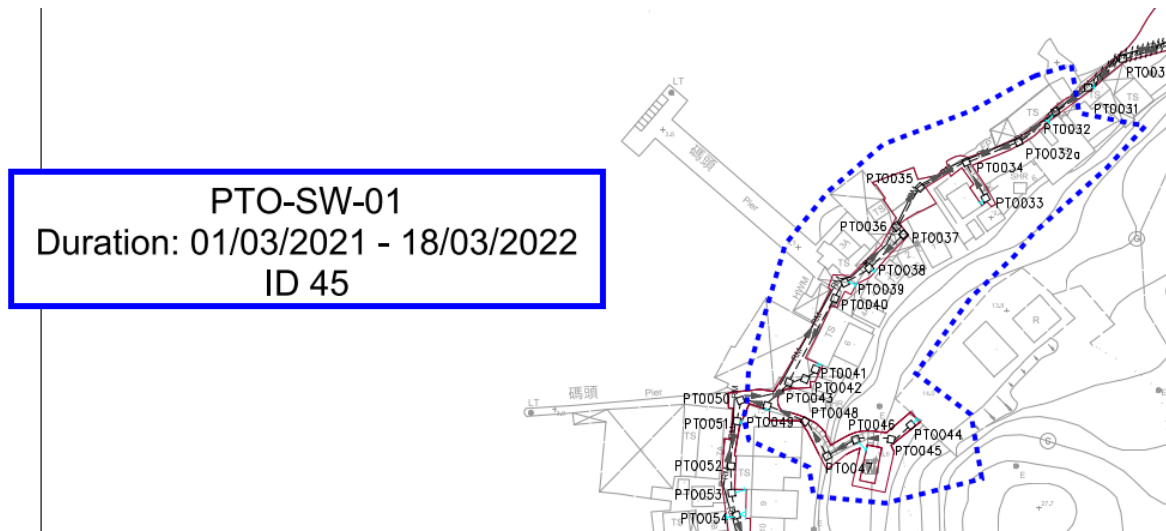
1.2 Summary of Main Works Undertaken and Key Measures Implemented

1.2.1 The main works undertaken during the reporting period are as follows:

1.2.2 PTO-SW-01 (Open Trench, 18 nos. manholes (170m), and rising main(CH2+53.81 - CH4+36.66)

- a) Installation of fencing
- b) Temporary diversion of existing sewerage
- c) Construction of sewer pipe, manhole and rising main by open trench
- d) Tapping sewer & timber box
- e) Air testing for the Pipe
- f) Reinstatement Works

Figure 1-1 Commencement of Construction Works Area in reporting month



1.2.3 Implementation of the key mitigation

a) Measures during the reporting period are as follow:

- All construction plants / machineries should be checked / serviced on a regular basis during the courses of construction to minimize the emission of noise generation and eliminate dark smoke emission.
- All C&D materials generated should be transported and stored at temporary storage area. Cover should be provided during transportation of dusty materials. Suitable materials should be sorted for reuse on-site. Only non-inert C&D material should be disposed off-site to NENT Landfill.
- All dump trucks should be equipped with mechanical covers to prevent the dust emission during transportation when necessary.
- Dust control measures, such as water spraying, should be provided during demolition works when necessary.
- Maintaining of wet surface on access road and keep slow speed in the site.
- Wastewater to be treated by wastewater treatment facilities before discharge.
- Conditions in the Environmental Permit and Discharge License should be followed.
- Fueling of equipment should be conducted carefully on-site by mobile tanker to avoid storage of fuel and oil spillage.
- Provision of drip trays for equipment likely cause spillage of chemical / fuel, and provide routine maintenance.
- Predict required quantity of concrete accurately and collect the unused fresh concrete at designated locations in the site for subsequent disposal.

1.2.4 Summary of Exceedances, Investigation and Follow-up

No Action or Limit Level exceedance record of construction noise and air quality was recorded in the reporting month.

1.2.5 Complaint Handling, Prosecution and Public Engagement

No complaints, notification of summons and successful prosecution was received in the reporting period. No public engagement activity was conducted in the reporting month. No air quality, noise and water complaints related to 0700 – 1900 hours on normal weekdays was received in the reporting month.

1.2.6 Reporting Change of EM&A Programme

According the Recording , there was no change for the EM&A programme in this reporting month.

1.2.7 Future Key Issues

(i) The main works will be anticipated in the next reporting period are as follows:

- PTO-SW-01 (Open Trench, 18 nos. manholes (170m), and rising main(CH2+53.81 - CH4+36.66)
 - a) Installation of fencing
 - b) Temporary diversion of existing sewerage
 - c) Construction of sewer pipe, manhole and rising main by open trench
 - d) Tapping sewer & timber box
 - e) Air testing for the pipe
 - f) Reinstatement Works

(ii) The following EP submission (EP No.: EP-516/2016) was submitted during the reporting month:

1.2.8 The 2021/03 monthly EM&A Report presents the air, noise and water quality impact monitoring works. The air and noise quality impact monitoring were

conducted on 3rd, 9th, 15th, 19th and 26th March 2021 at four monitoring locations AMS1N/NMS1N, AMS2N1/NMS2N1, AMS3N/NMS3N and AMS4N/NMS4N.

- 1.2.9 According to the Section 5.2.1 of EM&A manual, Regular monitoring of water quality should be carried out at water quality monitoring stations (WMS) near the cofferdam (impact station), upstream of the impact 9c control stations), and near representative water sensitive receivers (WSRs) (e.g. fish culture Zone, coral and amphioxus) before and throughout installation and extraction works. Refer to submitted construction works schedule and location plans (under condition 2.10 of environmental Permit 516/2016) construction works for installation and extraction of cofferdam and dredging works are schedule on August 2022.
- 1.2.10 Weekly Site inspection were conducted on 4th, 11th, 18th, 26th March 2021 and the Site Safety and Environmental Management Committees (SSEMC) was conducted on 18th March 2021 in this reporting month. No non-compliance with the contractual and legislative requirements was recorded, the mitigation measures recommended in the EIA report and the EM&A manual were fully implemented.

1.3 Reporting changes and Future key issues

- 1.3.1 According to the construction works schedule, construction works in next month show as below,

Construction Works Task for next coming month

PTO-SW-01 (Open Trench, 18 nos. manholes (170m), and rising main(CH2+53.81 - CH4+36.66)

- a) Installation of fencing
- b) Temporary diversion of existing sewerage
- c) Construction of sewer pipe, manhole and rising main by open trench
- d) Tapping sewer & timber box
- e) Air testing for the pipe
- f) Reinstatement Works

2. Introduction

2.1 Project Background

- 2.1.1 The proposed sewerage works in Po Toi O (hereafter as “Captioned Project”) is an environmental enhancement project that aims to improve environmental hygiene of the Po Toi O area.
- 2.1.2 Po Toi O is located in the southern part of Sai Kung District, next to Clear Water Bay. There is a small settlement called Po Toi O village around the bay. There is currently no public sewerage system for the village. Sewage and wastewater generated by local residents and local restaurants are treated by septic tanks/soakaway system (STS).
- 2.1.3 Sewage works at Po Toi O comprise sewage collection, treatment and disposal facilities at Po Toi O under Port Shelter Sewerage, Stage 3 – Sewerage Works at Po Toi O (hereinafter refer to “the Project”)
- 2.1.4 The Project in Po Toi O mainly comprises of the following items:
- i. Provision of village sewerage to the unsewered areas of Po Toi O. The works involve construction of about 800m of gravity sewers and 400m of rising mains;
 - ii. Construction of a local sewage treatment plant (STP) with Average Dry Weather Flow (ADWF) of about 139m³/day; and
 - iii. Construction of a submarine outfall of about 385m in length.
- 2.1.5 The Project consists of the following designated projects under Part I, Schedule 2 of the Environmental Impact Assessment Ordinance (EIAO):
- i. Item Q.1 – A sewage treatment plant and portion of sewer alignments in a conservation area;
 - ii. Item C.12 (a) (v) and (vii) – A dredging operation which is less than 500m from the nearest boundary of an existing fish culture zone and coastal protection area; and
 - iii. Item F.6 – A submarine sewage outfall.

- 2.1.6 The Environmental Impact Assessment (EIA) Report Port Shelter Sewerage, Stage 3 – Sewerage Works at Po Toi O (Register No: AEIAR-206/2017) was approved on 27 January 2017. A Variation of an Environmental Permit (EP) EP-516/2016 was issued on 27 January 2017 and it is the current permit for the Project.
- 2.1.7 Allied Environmental Consultants (AEC) has been appointed as the Environmental Team (ET) to undertake the EM&A programme during construction phase (2020 – 2022) of the Project.
- 2.1.8 The EM&A programme of this Project shall be implemented in accordance with the requirements and procedures set out in the EM&A Manual and the EP No. EP-516/2016.
- 2.1.9 The Air and Noise quality baseline monitoring work was conducted from 23 December 2020 to 5 January 2021 and the water quality baseline monitoring work was conducted from 17 December 2020 to 12 January 2021. A Baseline Monitoring Report had been submitted to EPD on 10 February 2021.
- 2.1.10 The construction phase and EM&A programme of the Project commenced on 1 March 2021.

2.2 Scope of Report

- 2.2.1 This is the 1st EM&A Report prepared by AEC for the Port Shelter Sewerage, Stage 3 – Sewerage Works at Po Toi O. This report summarized the monitoring results and audits findings of the EM&A programme under the issued EP (Condition 3.4 of EP No.: EP-516/2016) and in accordance with the EM&A Manual during the reporting period from 01/03/2021 to 31/03/2021.

2.3 Project Organisation

2.3.1 The project organization structure is shown in **Appendix A**. The key personnel contact names and numbers are summarized in **Table 2-1**.

Table 2-1 Contact Information of Key Personnel

Party	Position	Name	Telephone
DSD Drainage Services Department	Project proponent	Wing Law	2594 7297
ER Black & Veatch Hong Kong Limited	Resident Engineer	Eugen Chan	6392 3809
IEC Acuity sustainability consulting limited	Independent Environmental Checker	F.C. Tsang	2698 8060
ET Allied Environmental Consultants Limited	ET Leader	Timmy Wong	3915 7186
Contractor China Geo-engineering Corporation	Environmental Officer	Jasper Tang	6997 5530

2.4 Construction Programme and Activities

2.4.1 The construction phase of the Project under the EP commenced on 1 March 2021.

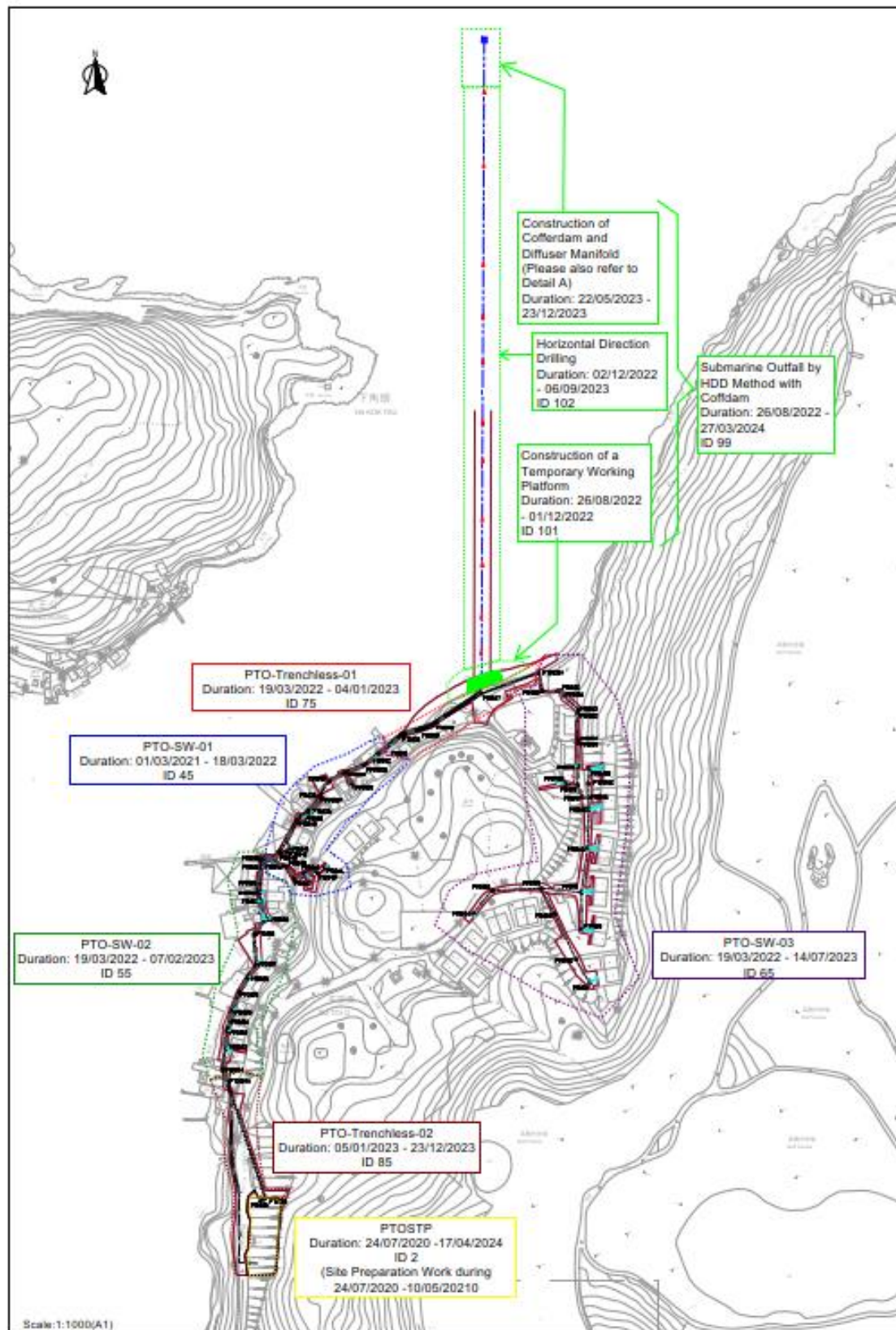
2.4.2 Details of the construction works undertaken during the reporting period are listed below:

- PTO-SW-01 (Open Trench, 18 nos. manholes (170m), and rising main (CH2+53.81 - CH4+36.66)
 - a) Installation of fencing
 - b) Temporary diversion of existing sewerage
 - c) Construction of sewer pipe, manhole and rising main by open trench
 - d) Tapping sewer & timber box
 - e) Air testing for the pipe
 - f) Reinstatement Works

2.4.3 The Construction Programme is shown in **Appendix B**.

2.4.4 The general layout plan of the Project site is shown in **Figure 2-1**.

Figure 2-1 General layout plan of the Project site.



2.5 Status of Environmental Licenses, Notification and Permits

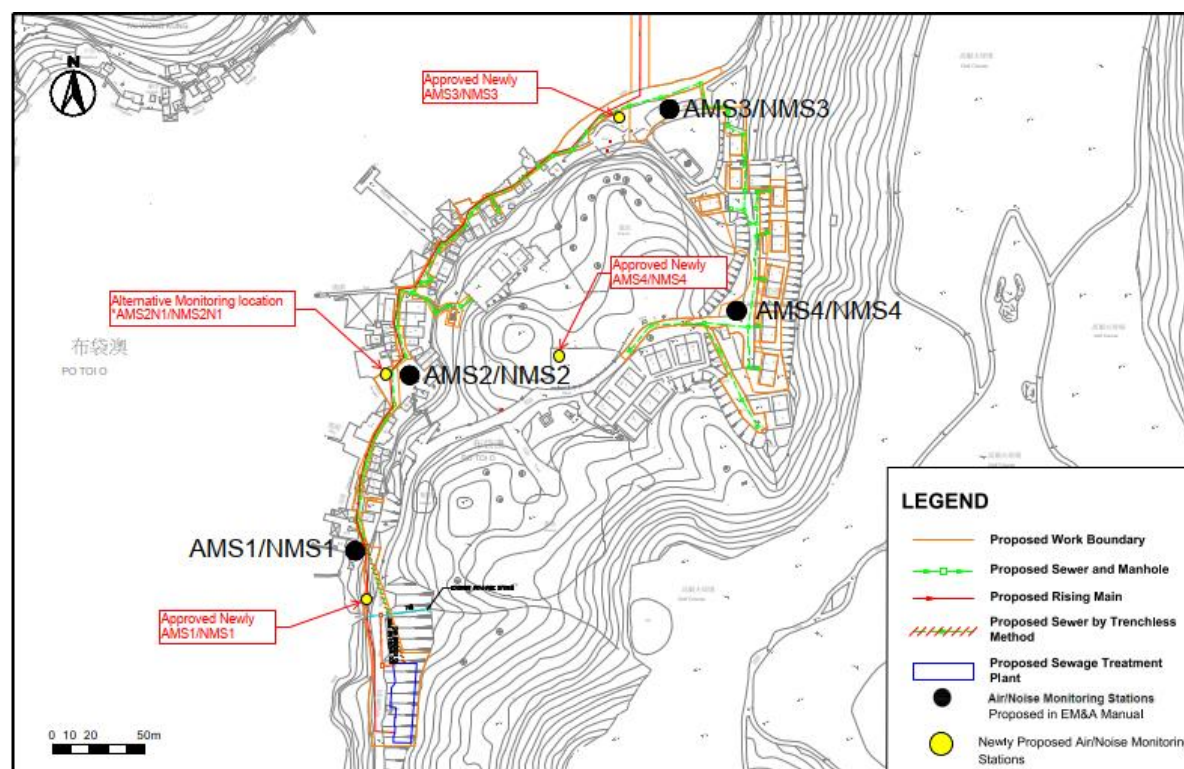
2.5.1 The environmental licenses and permits for the Project and valid in the reporting period are summarized in **Table 2-2**.

Table 2-2 Summary Status of Environmental License, Notification and Permit

License/ Notification/ Permit	Reference No.	Valid Period	
		From	To
Environmental Permit	EP-516/2016	27/01/2017	End of Project
Construction Dust Notification under APCO	458613	03/08/2020	N/A
Wastewater Discharge License - Landside	Under Application	-	-
Chemical Waste Producer Registration	5213-820-C3510-18	23/09/2020	N/A
Billing Account for Disposal of Construction Waste	WFG22785	17/08/2020	N/A

2.5.2 Project area and location of the monitoring and control stations are show in **figure 2-2**.

Figure 2-2 Project area and location of the monitoring stations



3. Air Quality Monitoring

3.1 Monitoring Requirements

3.1.1 In accordance with the EM&A Manual, impact Air Quality Monitoring shall be carried out throughout the construction period at all approved monitoring location. 24-hours TSP shall be conducted at least once in every 6 days, while that for 1-hour TSP shall be at least 3 times in every 6 days when the highest dust impact takes place. The Action and Limit levels for 1 hour and 24-hours TSP level are provided in **Table 3-1 & 3-2**.

Table 3-1 Action and Limit Levels for 1-hr TSP

Parameter	Monitoring Station	Action Level ($\mu\text{g}/\text{m}^3$)	Limit Level ($\mu\text{g}/\text{m}^3$)
1-hr TSP ($\mu\text{g}/\text{m}^3$)	AMS1N	319	500 $\mu\text{g}/\text{m}^3$
	AMS2N1	279	
	AMS3N	303	
	AMS4N	278	

Table 3-2 Action and Limit Levels for 24-hr TSP

Parameter	Monitoring Station	Action Level ($\mu\text{g}/\text{m}^3$)	Limit Level ($\mu\text{g}/\text{m}^3$)
24-hr TSP ($\mu\text{g}/\text{m}^3$)	AMS1N	158	260 $\mu\text{g}/\text{m}^3$
	AMS2N1	179	
	AMS3N	162	
	AMS4N	146	

3.2 Monitoring Equipment

3.2.1 The 24-hour TSP air quality monitoring shall be performed using High Volume Air Samplers (HVS) located at each of the approved monitoring station. While 1-hour TSP air quality monitoring will be performed using portable TSP monitors. Wind Speed measurement shall be conduct with anemometer for each monitoring location. The Brand and model of the equipment is given in **Table 3-3**.

Table 3-3 summarizes the equipment used in air quality monitoring.

Item	Brand	Model	Equipment	Serial Number /Location ID
1	Tisch	TE-5170	High Volume Sampler	4350 /AMS1N
2	Tisch	TE-5170	High Volume Sampler	4374/ AMS2N1
3	Tisch	TE-5170	High Volume Sampler	2089/ AMS3N
4	Tisch	TE-5170	High Volume Sampler	3796/ AMS4N
5	Tisch	TE-5025A	HVS Sampler Calibrator	2154
6	Sibata	Model LD-5R	Sibata Portable TSP Monitors	761106/AMS1N
7	Sibata	Model LD-5R	Sibata Portable TSP Monitors	620407/ AMS2N1
8	Sibata	Model LD-5R	Sibata Portable TSP Monitors	620408/ AMS3N
9	Sibata	Model LD-5R	Sibata Portable TSP Monitors	882146/ AMS4N
10	Benetech	GM816	Anemometer	WS-09

3.2.2 Meteorological information extracted from “Hong Kong Observatory – Waglan Island Weather Station” was proposed as the alternative method to obtain representative wind data. For Waglan Island Weather Station, it is located nearby the Project site. The station’s wind data monitoring equipment is set above the existing ground ten meters in compliance with the general setting up requirement. Furthermore, this station also provides other meteorological information, such as the humidity, rainfall, air pressure and temperature etc.

3.3 Monitoring Locations

3.3.1 Monitoring stations AMS1N , AMS2N1 , AMS3N and AMS4N were set up at the proposed locations in accordance to the requirements for placement of equipment, set out in section 3.5.3 of the EM&A manual of the Captioned Project. The location of the new representative AMSs and equipment used are given in **Table 3-4**. Location of the alternative AMSs is shown in **Figure 3-1**. and **Table 3-4** describes the details of the monitoring stations.

Figure 3-1 Proposed Air Quality Monitoring Locations

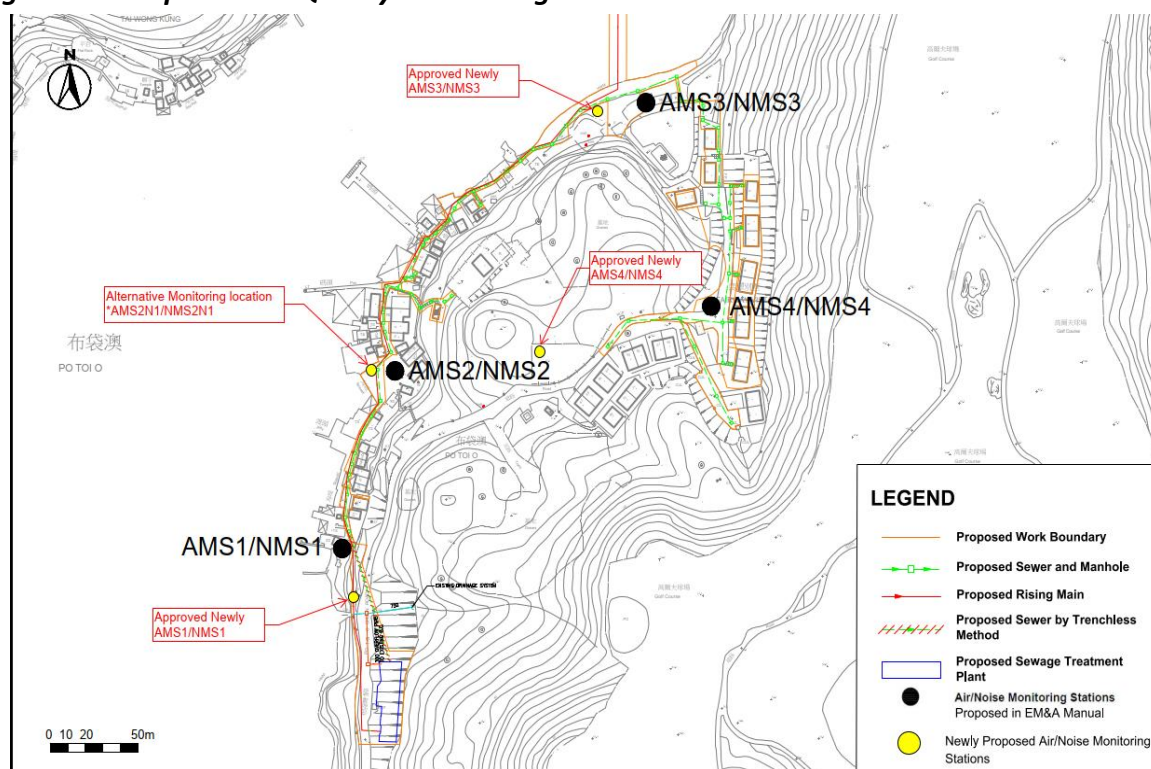


Table 3-4 Location of Impact Noise Monitoring Stations

Identification No.	Location	Type of Monitoring	Duration
AMS1N*	Footpath above House No. 28 Po Toi O Chuen Road	TSP	1 hr & 24 hrs
AMS2N1*	Open space Approx. 15 m from Hung Shing Temple	TSP	1 hr & 24 hrs
AMS3N*	Vacant land near Temporary Structure (House) Rocky Shore	TSP	1 hr & 24 hrs
AMS4N*	Resting shelter near Seacrest Villas	TSP	1 hr & 24 hrs

*With non-accessible reason, the monitoring location AMS1 – AMS4 proposed in EM&A Manual were replace by alternative monitoring Location AMS1N – AMS4N was approved by ER and IEC.

3.4.1 **Table 3-5** summarizes the monitoring parameters, frequency and duration of impact monitoring

Table 3-5 Monitoring Parameters, Duration and Frequency of Air Quality Monitoring

Parameter	Duration	Frequency
1-hr TSP	3 times in every 6 days	1 hour x 3 per day
24-hr TSP	Once in every 6 days	24 hours per day

3.5 Monitoring Methodology

24-Hour TSP monitoring by High Volume Sampler (HVS)

3.5.1 In accordance with the Approved EM&A Manual Section 3.3, HVS complying with the following specifications used to be used for carrying out the 24-hour TSP monitoring:

- a) 1.7 m³ per minute adjustable flow range;
- b) Equipped with a timing / control device with +/- 5 minutes accuracy for 24 hours operations;
- c) Installed with elapsed-time meter with +/- 2 minutes accuracy for 24 hours operation;
- d) Capable of providing a minimum exposed area of 406cm²;
- e) Flow control accuracy: +/-2.5% deviation over 24-hour sampling period;
- f) Equipped with a shelter to protect the filter and sampler;
- g) Incorporated with an electronic mass flow rate controller or other equivalent devices;
- h) Equipped with a flow recorder for continuous monitoring;
- i) Provided with a peaked roof inlet;
- j) Incorporated with a manometer;
- k) Able to hold and seal the filter paper to the sampler housing at horizontal position;
- l) Easily changeable filter; and
- m) Capable of operating continuously for a 24-hour period.

- 3.5.2 The HVS used to be calibrated bimonthly in accordance to the specification in the manufacturer's manual. The calibration certificates used to be available to the IEC for checking upon request. The validity and accuracy of the HVS used to also be tested to establish thermal equilibrium before placing any filter media at the designated air monitoring station.
- 3.5.3 Against the result by the TE-5025A Calibration Kit periodically, the details for TE-5025A Calibration Kit is given in **Appendix C3**.
- 3.5.4 Tisch TE-5170 is chosen as the HVS for 24-hour TSP monitoring and Tisch TE – 5025A is chosen as the HVS Calibration-Kit for HVS calibration.

Operation Procedures for HVS

- 3.5.5 Prior to the commencement of the dust sampling, the flow rate of the high-volume sampler used to be properly set. The power supply should be checked to ensure the sampler worked properly. The sampler is recommended to be operated for 5 minutes
- 3.5.6 The filter holding frame should be removed by loosening the four nuts and placing carefully a weighted and conditioned filter at the centre with the stamped number upwards on a supporting screen.
- 3.5.7 The filter should be aligned on the screen so that the gasket formed an airtight seal on the outer edges of the filter. The filter holding frame should be tightened to the filter holder with swing bolts. The Applied pressure should be sufficient to avoid air leakage at the edges.
- 3.5.8 A programmed timer should be used to control the duration of operation. Information should be recorded on the record sheet, which included the starting time, the weather condition and the filter number.
- 3.5.9 After sampling process is finished, the filter should be removed and sent to a HOKLAS accredited laboratory for weighting. The elapsed time should also be recorded.
- 3.5.10 All filters should be equilibrated in a conditioning environment for 24 hours before weighting. The conditioning environment temperature should be between 25°C and 30°C and not vary by more than $\pm 3^{\circ}\text{C}$; the relative humidity (RH) should be $< 50\%$ and not vary by more than $\pm 5\%$. A convenient working RH is 40%.

3.5.11 The high-volume motors and their accessories should be properly maintained. Appropriate maintenance such as routine motor brushes replacement and electrical wiring checking should be made to ensure that the equipment and necessary power supply were in good working condition. Initial calibration of dust monitoring equipment used to be conducted upon installation and thereafter at fortnightly intervals. The transfer standard used to be traceable to the internationally recognized primary standard and be calibrated annually. HVS should be calibrated bimonthly.

To protect the HVS from being damaged and to operate without disturbances or nuisance, metal cage enclosures are equipped to all HVS, and temporary barriers can also be erected around the monitoring equipment, with at least 0.5m of spacing, during the monitoring period.

1-Hour TSP monitoring by Direct Reading Dust Meter

3.5.12 Portable Laser Particle Photometer Monitors (Sibata Model LD-3B/5R) complete with Appropriate sampling inlets are proposed for 1-hour TSP monitoring.

Operation Procedures for Direct Reading Dust Meter

3.5.13 The measuring procedures of the direct read dust meter are in accordance with the Manufacturer's instruction Manual as follows:

- a) Pulling up the air sampling inlet cover
- b) Changing the Mode 0 to BG
- c) Pressing Start/Stop switch
- d) Turning the knob to SENSI.ADJ and press it
- e) Pressing Start/Stop switch again
- f) Returning the knob to the position MEASURE slowly
- g) Pressing the timer set switch to set measuring time
- h) Removing the cap and start the measurement

- 3.5.14 ET shall submit sufficient information to the IEC to prove that the instrument is capable of achieving comparable results to the HVS. The instrument also used to be calibrated annually in accordance to the specification in the manufacturer's manual, and the 1-hour sampling used to be determined periodically by the HVS to check the validity and accuracy of the results measured by direct reading method. The frequency of correlation calibration of the direct Reading dust meter shall be conduct in bi-monthly. Details for Correlation calibration between direct reading dust meter and HVS is provided in **Appendix C5**.
- 3.5.15 To protect the dust meter from being damaged and to operate without disturbances or nuisance, temporary barriers used to be erected around the monitoring equipment during the monitoring period. Temporary barriers will be placed Approx. 0.5m away from the dust meter.

Alternative Monitoring equipment for TSP monitoring

- 3.5.16 As the power supply for High Volume Sample (HVS) for TSP monitoring at alternative monitoring locations were rejected, direct reading dust meter was used to measure both 1-hour and 24-hour average TSP levels.
- 3.5.17 The proposal for alternative monitoring equipment (i.e. direct reading dust meter) for TSP monitoring was approved by IEC and ER.
- 3.5.18 HVS for 24-hr TSP monitoring will be adopted once secured supply of electricity become available for any approved TSP monitoring location.

3.6 Monitoring Results and Observations

- 3.6.1 The schedule for environmental monitoring in the reporting period is provided in **Appendix E2**.
- 3.6.2 The monitoring results for air quality monitoring are summarized in **Table 3-6** and the monitoring data is provided in **Appendix C1**.

Table 3-6 Summary of Air Quality Monitoring Results in the Reporting Period

Parameter	Monitoring Station	Average (µg/m ³)	Range (µg/ m ³)
1-hr TSP in µg/m ³	AMS1N	64	49 - 86
	AMS2N1	69	36 - 98
	AMS3N	72	45 - 127
	AMS4N	72	45 -103

Parameter	Monitoring Station	Average (µg/m ³)	Range (µg/ m ³)
24-hr TSP in µg/m ³	AMS1N	55	36 - 75
	AMS2N1	62	32 - 90
	AMS3N	64	31 - 109
	AMS4N	62	37 -98

3.6.3 No Action or Limit Level exceedance of air quality was recorded in the reporting month. No air quality complaints related to 0700 – 1900 hours on normal weekdays was received in the reporting month.

3.6.4 The event and action plan are annexed in **Appendix C7**.

3.6.5 Other factor influencing the monitoring results

3.6.6 Major emission sources during air quality monitoring in the reporting period were mainly vehicle emission from Po Toi O Chuen Road and Residents activities.

4. Noise Monitoring

4.1 Monitoring Requirements

4.1.1 In accordance with the EM&A Manual, impact noise monitoring was conducted or daytime construction work on normal weekdays (0700-1900 Monday to Saturday), one set of 30-min measurement shall be carried out at each approved Noise Monitoring Stations (NMS) every week based on the measurement procedures under the Noise Control Ordinance-TM. The Action and Limit levels for construction noise is provided in **Table 4-1**.

Table 4-1 Action and Limit Levels for Construction Noise

Station ID	Noise Sensitive Receivers	Description	Action Level	Limit Level
NMS1N	PTO_N1	Footpath above House No. 28 Po Toi O Chuen Road	When one documented complaint is received from any one of the noise sensitive receivers	75 dB(A)*
NMS2N1	PTO_N2	Open space Approx. 15 m from Hung Shing Temple		
NMS3N	PTO_N3	Vacant land near Temporary Structure (House) Rocky Shore		
NMS4N	SV_N1	Resting shelter near Seacrest Villas		

Note: *75 dB(A) for residential premises.

4.2 Monitoring Equipment

4.2.1 Noise monitoring was performed using sound level meter at each designated monitoring station. The sound level meters deployed comply with the International Electrotechnical Commission Publications (IEC) 651:1979 (Type 1) and 804:1985 (Type 1) specifications. Acoustic calibrator was 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**.

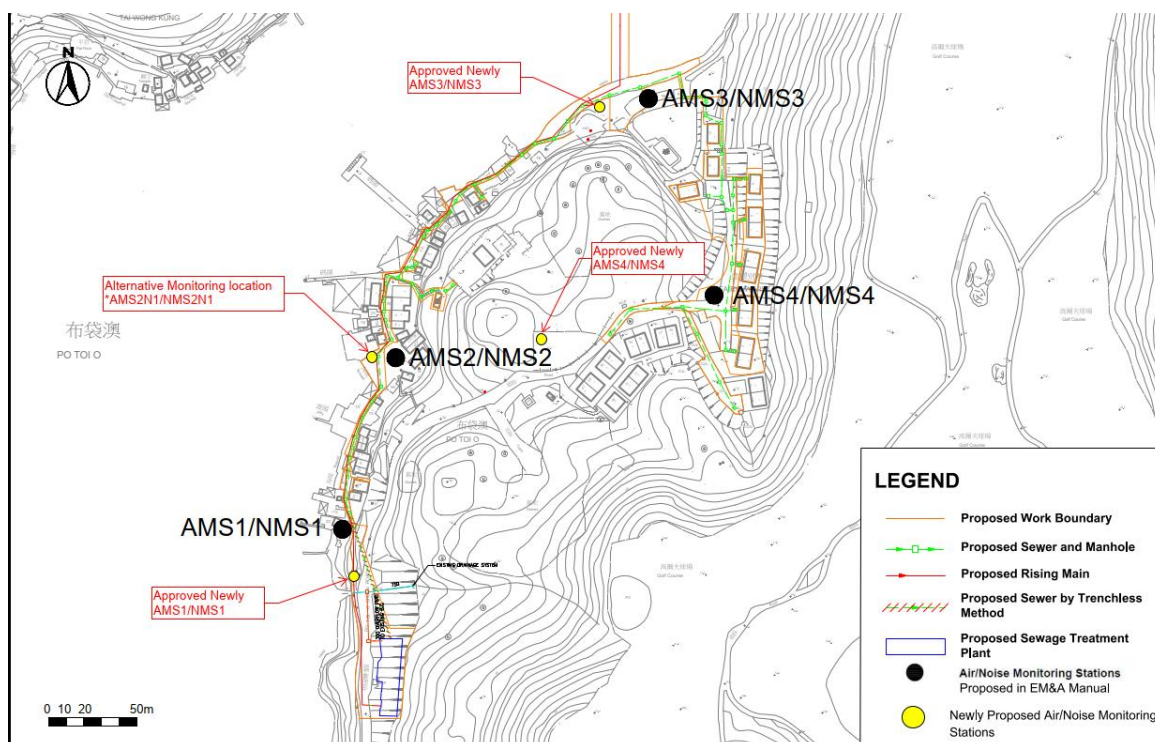
Table 4-2 Noise Monitoring Equipment

Equipment	Brand and Model	Serial No. /Equipment ID
Integrated Sound Level Meter	Casella – CEL-63X	1488269
Integrated Sound Level Meter	Casella – CEL-63X	1488271
Integrated Sound Level Meter	Casella – CEL-63X	1488300
Acoustic Calibrator	Casella – CEL-120/1	4358251
Acoustic Calibrator	Casella – CEL-120/1	5230736
Acoustic Calibrator	Casella – CEL-120/1	5230758
Anemometer	Benetech – GM816	WS-09

4.3 Monitoring Locations

4.3.1 Due to the limitation posed by the approved monitoring stations set out by the EM&A manual, Monitoring stations NMS1N, NMS2N1, NMS3N and NMS4N were set up at the alternative representative Noise Quality Monitoring Stations (NMSs) proposed locations in accordance to Section 4.5.3 of the EM&A Manual and approved from the ER and the IEC. **Figure 4-1** shows the location of the monitoring stations. **Table 4-3** describes the details of the monitoring stations.

Figure 4-1 Proposed Noise Monitoring Locations



Identification No.	Location	Type of measurement	Type of Monitoring	Duration
NMS1N*	Footpath above House No. 28 Po Toi O Chuen Road	Free-field	Noise	30 mins
NMS2N1*	Open space Approx. 15 m from Hung Shing Temple	Free-field	Noise	30 mins
NMS3N*	Vacant land near Temporary Structure (House) Rocky Shore	Free-field	Noise	30 mins
NMS4N*	Resting shelter near Seacrest Villas	Free-field	Noise	30 mins

Note: For Free-field measurement, a correction of +3dB(A) should be made to the measured results.

* Due to the limitation posed by the approved monitoring stations set out by the EM&A manual, four alternative representative Noise Quality Monitoring Stations (NMSs) are proposed. The alternative monitoring Locations were approved by ER and IEC.

4.4 Monitoring Parameters and Frequency

4.4.1 **Table 4-4** summarizes the monitoring parameters, frequency and duration of impact noise monitoring.

Table 4-4 Noise Monitoring Parameters, Frequency and Duration

Parameter and Duration	Frequency
30-mins measurement at each monitoring station between 0700 and 1900 on normal weekdays. L _{eq} , L ₁₀ and L ₉₀ would be recorded.	At least once per week

4.5 Monitoring Methodology

4.5.1 Monitoring Procedure

- (a) Free-field measurement was made at monitoring stations NMS1N ,NMS2N1 , NMS3N and NMS4N. For free-field measurement, a correction factor of +3 dB (A) would be applied.
- (b) The sound level meter was set on a tripod at a point 1m from the exterior of the façade of the sensitive receivers building and at a height of 1.2 m above the ground for freefield measurements at monitoring stations.
- (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:
 - (i) frequency weighting: A
 - (ii) time weighting: Fast
 - (iii) time measurement: $L_{eq(30\text{-minutes})}$ during 07:00 – 1900 on normal weekdays
- (e) Prior to and after each noise measurement, the meter was calibrated 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.
- (f) During the monitoring period, the L_{eq} , L_{10} and L_{90} were recorded. In addition, site conditions and noise sources were recorded on a standard record sheet.
- (g) Noise measurement would be paused during periods of high intrusive noise (e.g. dog barking, helicopter noise) if possible. Observations would be recorded when intrusive noise was unavoidable.
- (h) The wind speed at the monitoring station was checked with the portable wind speed meter. Noise monitoring would be cancelled in the presence of fog, rain, wind with a steady speed exceeding 5m/s, or wind with gusts exceeding 10m/s.

4.5.2 Maintenance and Calibration

- (a) The microphone head of the sound level meter was cleaned with soft cloth at regular intervals.
- (b) The meter and calibrator were sent to the supplier or HOKLAS laboratory to check and calibrate at yearly intervals.
- (c) Calibration certificates of the sound level meters and acoustic calibrators are provided in **Appendix D3**.

4.6 Monitoring Results and Observations

- 4.6.1 The schedule for environmental monitoring in the reporting period is provided in **Appendix E2**.
- 4.6.2 The monitoring results for construction noise are summarized in **Table 4-5** and the monitoring data is provided in **Appendix D1**.

Table 4-5 Summary of Construction Noise Monitoring Results in the Reporting Period

Station ID	Construction Noise Level, dB(A)*, Leq (30 min)	Baseline Level, dB(A)	Limit Level, dB(A)
NMS1N	63.2 dB(A)	62.7 dB(A)	75
NMS2N1	59.2 dB(A)	61.8 dB(A)	75
NMS3N	62.5 dB(A)	64.6 dB(A)	75
NMS4N	55.3 dB(A)	58.1 dB(A)	75

Note: *A correction of +3 dB(A) was made to the free field measurements. Leq (30min) was measured at 0700-1900 hours on normal weekdays.

4.6.3 No Action or Limit Level exceedance of construction noise was recorded in the reporting month. No noise complaints related to 0700 – 1900 hours on normal weekdays was received in the reporting month.

4.6.4 The event and action plan are annexed in **Appendix D4**.

4.7 Other factor influencing the monitoring results

4.7.1 Major noise sources during noise monitoring in the reporting period were mainly road traffic noise.

5. Water Quality Monitoring

5.1 Monitoring Requirements

- 5.1.1 In accordance with the recommendations of the EIA, impact water quality monitoring shall be carried out 3 days per week, at mid-flood and mid-ebb tides (within ± 1.75 hour of the predicted time required) at all the approved Water Quality Monitoring Stations (WQMS) during whole cofferdam installation/extraction work and during dredging works. The interval between two sets of monitoring shall not be less than 36 hours.
- 5.1.2 Replicate in-situ measurements of Suspended solids (SS) and in-situ water quality data (temperature, pH, turbidity, water depth, salinity, dissolved oxygen and percentage of saturation) shall be collected.
- 5.1.3 Other relevant data should also be recorded, including monitoring location/position, time, tidal stages, weather conditions and any special observation or works that may affect the monitoring results in the vicinity.
- 5.1.4 To ensure sufficient data for robust analysis, duplicate in-situ data shall be collected. In case the difference in the duplicate in-situ measurement results is larger than 25%, the third set of in-situ measurement shall be carried out for result confirmation purpose.
- 5.1.5 Water samples shall be extracted at 1m below surface, 1m above seabed and the mid-depth level at where the water depth is at least 6m. However, if the water depth is less than 3m, water samples shall only be collected at the mid-depth level. For stations with depth less than 6m, the mid-depth sample can be omitted.
- 5.1.6 In addition, duplicated water samples for suspended solid analysis shall be collected at all the above stations and delivered to the HOKLAS accredited laboratory for analysis. Results for suspended solids shall be received back from the laboratory within 24-hour of the receipt of the samples.
- 5.1.7 Impact monitoring shall also be conducted at the same frequency as baseline monitoring throughout the whole cofferdam installation/extraction work and

during dredging work. In case exceedance of Action/Limit Level is recorded, the frequency shall be increased as per the Event and Action Plan.

5.1.8 The Impact Monitoring schedule shall be issued to IEC at least one month prior to the commencement of Impact Monitoring.

5.2 Monitoring Parameters, Frequency

5.2.1 Summarized the monitoring parameters, monitoring periods and frequencies of the water quality monitoring show as **Table 5-1**.

Table 5-1 Summarized the monitoring parameters, monitoring periods and frequencies of the water quality monitoring

Parameters	Duration	Frequency
<ul style="list-style-type: none"> • Temperature(°C) • pH(pH unit) • Turbidity (NTU) • Water depth (m) • Salinity (ppt) • DO (mg/L and % of saturation) • SS (mg/L) 	<u>Construction:</u> Throughout installation and extraction of cofferdam and during dredging	<ul style="list-style-type: none"> • 3 days per week

5.3 Monitoring Locations

5.3.1 According to section 5.2.6 of the EM&A manual of the project, 6 water quality monitoring stations (WMSs) are proposed at the Po Toi O Fish Culture Zone, major amphioxus habitats and rocky shores where coral thrives. With reference to the tidal characteristics of Po Toi O Bay, 3 control stations are proposed where fresh marine water is not affected by the cofferdam installation/ extraction works, and 2 impact stations are proposed near the cofferdam under different tidal periods. All water quality monitoring stations show as **Figure 5-1** and **Table 5-2**.

Figure 5-1 Water Quality monitoring station location map

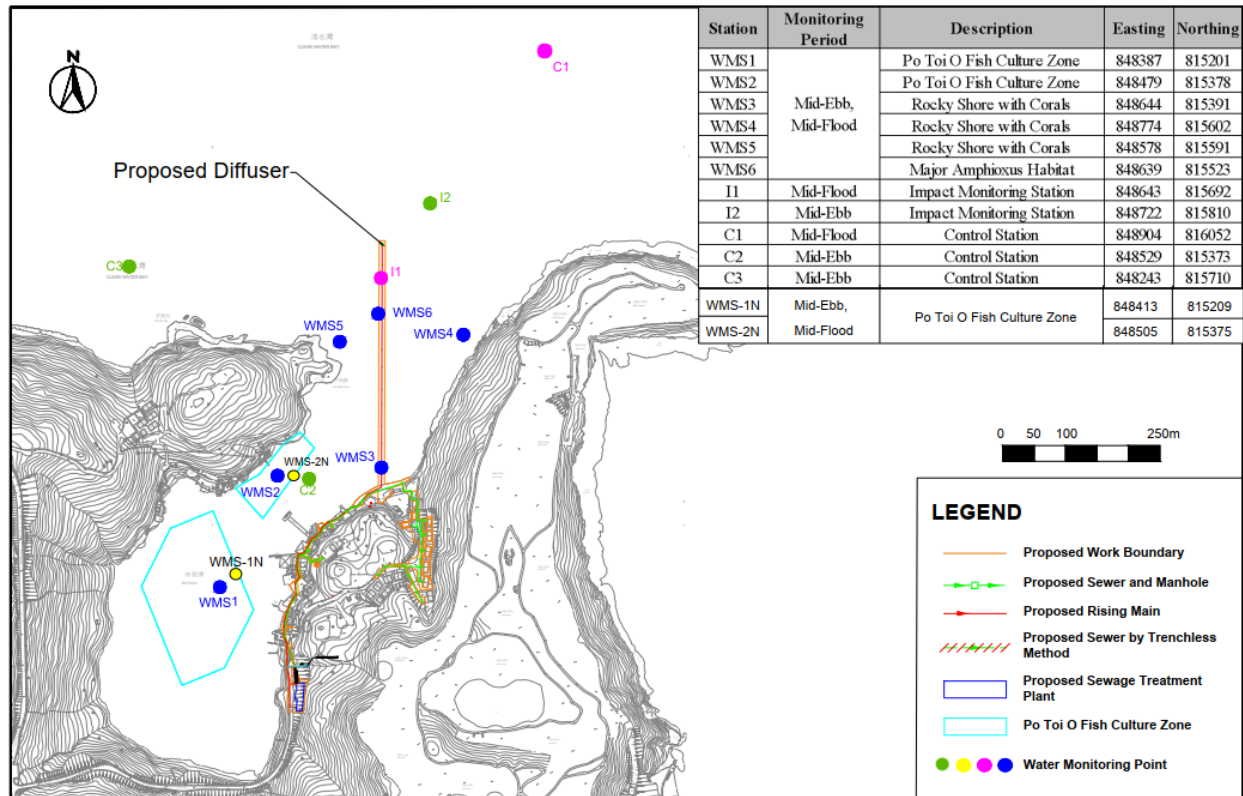


Table 5-2 Summary of Water Quality Monitoring station

Station	Monitoring Period	Description	Easting	Northing
*WMS1N	Mid-Ebb , Mid-Flood	Po Toi O Fish Culture Zone	848416	845209
*WMS2N	Mid-Ebb , Mid-Flood	Po Toi O Fish Culture Zone	848505	815375
WMS3	Mid-Ebb , Mid-Flood	Rocky Shore with Corals	848644	815391
WMS4	Mid-Ebb , Mid-Flood	Rocky Shore with Corals	848774	815602
WMS5	Mid-Ebb , Mid-Flood	Rocky Shore with Corals	848578	815591
WMS6	Mid-Ebb , Mid-Flood	Major Amphioxus Habitat	848639	815523
I1	Mid-Flood	Impact monitoring Station	848643	815692
I2	Mid-Ebb	Impact monitoring Station	848722	815910
C1	Mid-Flood	Control station	848904	816052
C2	Mid-Ebb	Control station	848529	815373
C3	Mid-Ebb	Control station	848243	815710
WMS1	Mid-Ebb , Mid-Flood	Po Toi O Fish Culture Zone	848387	815201
WMS2	Mid-Ebb , Mid-Flood	Po Toi O Fish Culture Zone	848479	815378

*WMS1N, WMS2N are new proposed alternative monitoring location. As previous EIA proposed monitoring location WMS1, WMS2 are situated in fish barges within the Fish Culture Zone (FCZ), and accesses to WMS1 and WMS2 were subsequently denied by the tenants of the fish barges.

5.4 Results and Observations

- 5.4.1 According to submission of construction works schedule and location plan under the Environmental Permit (EP 516/2016) Condition 2.10, the proposed period of commencement construction work with cofferdam installation / extraction work and during dredging works are August 2022.
- 5.4.2 As construction works schedule show that, the marine construction was not commenced within the reporting month, hence no water quality was conducted.
- 5.4.3 Refer to section 5.2.10 and 5.2.11 of approved EM&A Manual, construction phase site inspection for water quality mitigation measures and check the contractor's work practice on water pollution prevention during construction phase has been conducted during weekly site audit.
- 5.4.4 During the weekly site audit of this reporting month, no non- conformance water pollution was identified / observed in the commencement works area.

6. Waste Management Status

- 6.1.1 Auditing of waste management practices during regular site inspections will confirm that the waste generated during construction are properly stored, handled and disposed of. The construction Contractor(s) will be responsible for the implementation of any mitigation measures to reduce waste or redress issues arising from the waste materials.
- 6.1.2 The C&D waste under this contract should be disposal of at North East New Territories (NENT) Landfill and Tseung Kwan O Area 137 Fill Bank (TKO137FB).
- 6.1.3 Monthly summary of waste flow table is detailed in **Appendix H**.
- 6.1.4 During regular site auditing, the Mitigation Measures proposed in the Implementation schedule of Recommended Mitigation Measures with the EIA has been effectively implemented in the commencement works area. No unacceptable impact was observed from the construction works in reporting month.

7. Ecology Mitigation Measures

- 7.1.1 According to the approved EIA report, indirect water quality impact may arise from surface runoff or accidental spillage of chemicals in construction phase. Also, use of powered plant equipment may bring noise disturbance on wildlife.
- 7.1.2 During regular site auditing, the Mitigation Measures proposed in the Implementation schedule of Recommended Mitigation Measures with the EIA has been are effectively implemented in the commencement works area. No unacceptable impact was observed from the construction works in reporting month.

8. Fisheries

- 8.1.1 According to the Section 8 of approved EIA report, water quality at Fish Culture Zone (FCZ) will be monitored during cofferdam installation and extraction works and dredging works in the construction phase as proposed in Section 5.2 of the EIA.
- 8.1.2 In according to section 8.2.1 of EM&A manual, No specific monitoring and audit programme is required. With proper implementation of water quality mitigation measures, residual impact is anticipated to be acceptable.
- 8.1.3 According to section 8.2.2 of the EM&A manual , during regular site inspection, the Mitigation Measures proposed in the Implementation schedule of Recommended Mitigation Measures with the approved EIA has been are effectively implemented in the commencement works area. No un-acceptable impact was observed from the construction works in reporting month.

9. Landscape and Visual

- 9.1.1 According to section 10.2.1 of the approved EIA report, the recommended landscape and visual mitigation measures under Chapter 10 of the EIA has been effectively implemented in the commencement works area.
- 9.1.2 Tree risk assessment was already taken by the contractor during construction to all existing trees within the project site as per “Guidelines for Tree Risk Assessment and Management Arrangement”.
- 9.1.3 During regular site auditing, the Mitigation Measures proposed in the Implementation schedule of Recommended Mitigation Measures with the EIA has been are effectively implemented in the commencement works area. No un-acceptable impact was observed from the construction works in reporting month.

10. Built Heritage

- 10.1.1 According to the section 11 of approved EIA report, during construction phase, mitigation measures such as the provision of protective covering or protective screen is recommended to GB01, BH02, LF01 and LF04 in order to prevent damages by construction tools or waste. Maintenance of public access is suggested for LF01, LF04 and LF05. Besides, buffer zone of at least 1m from the works boundary should be provided for BH02, LF01 and LF04 as far as possible. Condition survey, vibration and settlement monitoring to GB01, BH02 and LF04 mentioned in Section 11.2.1 shall be implemented.
- 10.1.2 In according to the commencement works area (PTO_SW_01), there were two of the identified landscape features LF04 and LF 05 include the works area.
- 10.1.3 During regular site inspection, environmental team (ET) had reminded contractor to maintenance of public access and provide buffer zone from the works boundary to prevent damages by construction tools or waste.
- 10.1.4 In according to regular site inspection record, the Mitigation Measures proposed in the Implementation schedule of Recommended Mitigation Measures with the EIA has been are effectively implemented in the commencement works area. No un-acceptable impact was observed from the construction works in reporting month.

11. Implementation status on environmental protection requirements

- 11.1.1 The Contractor has implemented environmental mitigation measures and requirements as stated in the EIA Report, the EP and EM&A Manual. The implementation status of the environmental mitigation measures of the reporting period is summarized in **Appendix G**. The implementation of the key mitigation measures during the reporting period is presented in **Appendix H**
- 11.1.2 In according to regular site inspection, necessary mitigation measures were implemented properly, observations and reminders were issued to the Contractor where actions were taken by the Contractor to rectify the identified issues.

12. Environmental site inspection and audit

12.1 Site Inspection

12.1.1 Site Inspections were carried out by ET on a weekly basis to monitor the implementation of proper environmental pollution control and mitigation measures for the Project. Key observations were recorded in the site inspection checklist and passed to the Contractor together with the appropriate recommended mitigation measures where necessary.

12.1.2 In the reporting period, 4 site inspections were carried out on 4, 11, 18 and 26 March 2021. A joint site inspection with IEC was carried out on 18 March 2021. No non-compliance was recorded during the site inspections. Number of observations items is summarized in **Table 12-1**. Details of observations recorded during the site inspections are presented in **Appendix G**.

Table 12-1 Number of Observations and Recommendations of Site Inspection in this reporting month

Parameters	Date	Observations and Recommendations	Follow up
Water Quality	N/A	0	N/A
Air Quality	N/A	0	N/A
Noise	N/A	0	N/A
Waste/ Chemical Management	N/A	0	N/A
Ecology	N/A	0	N/A
Fisheries	N/A	0	N/A
Built Heritage	N/A	0	N/A
Landscape & Visual	N/A	0	N/A
Permits/ Licenses	N/A	0	N/A

Remark: No Construction Works observed in the commencement works area (PTO_SW_01) in this reporting month.

12.2 Summary of Complaints, Notification of Summons, Successful Prosecutions and Public Engagement Activities

- 12.2.1 No complaints, notification of summons and successful prosecution was received in the reporting period.
- 12.2.2 No public engagement activities were conducted in the reporting period.
- 12.2.3 Statistics on complaints, notifications of summons, successful prosecutions and public engagement activities are summarized in **Appendix I**.

13. Future Key Issues

13.1 Construction Programme for the Coming Month

13.1.1 The major construction works for the Project in the coming month will be:

- PTO-SW-01 (Open Trench, 18 nos. manholes (170m), and rising main(CH2+53.81 - CH4+36.66
 - a) Installation of fencing
 - b) Temporary diversion of existing sewerage
 - c) Construction of sewer pipe, manhole and rising main by open trench
 - d) Tapping sewer & timber box
 - e) Air testing for the pipe
 - f) Reinstatement Works

13.2 Key Issues for the Coming Month

13.2.1 Potential environmental impacts due to the construction activities, including air quality, noise, water quality, waste, landscape and visual, will be monitored or reviewed. The ET will continue to implement the environmental monitoring & audit programme in accordance with the EM&A Manual and Environmental Permit requirement. The recommended environmental mitigation measures shall be implemented on site and regular inspections as required will be carried out to ensure that the environmental conditions are acceptable.

13.2.2 The anticipated impact of major work activities within the site and the recommended mitigation measures are shown in **Appendix H**.

13.3 Monitoring Schedule for the Coming Month

13.3.1 The tentative schedule for environmental monitoring in April 2021 is provided in **Appendix E2**.

14. Conclusions

14.1 General

14.1.1 The construction works for the Project commenced on 1 March 2021. The ET of the Project has undertaken environmental site inspections under the construction phase EM&A programme during the reporting month.

14.2 Environmental Impact monitoring

14.2.1 No Action or Limit Level exceedance of construction air quality, noise was recorded in the reporting month. No air quality complaints and noise complaints related to 0700 – 1900 hours on normal weekdays was received in the reporting month.

14.3 Environmental Site Inspections

14.3.1 Environmental site inspections were carried out in the reporting month. Recommendations on remedial actions were given to the Contractors for the deficiencies identified during the site audits.

14.4 Complaint Log

14.4.1 There was no complaint received in relation to the environmental impact during the reporting period.

14.5 Reporting Changes

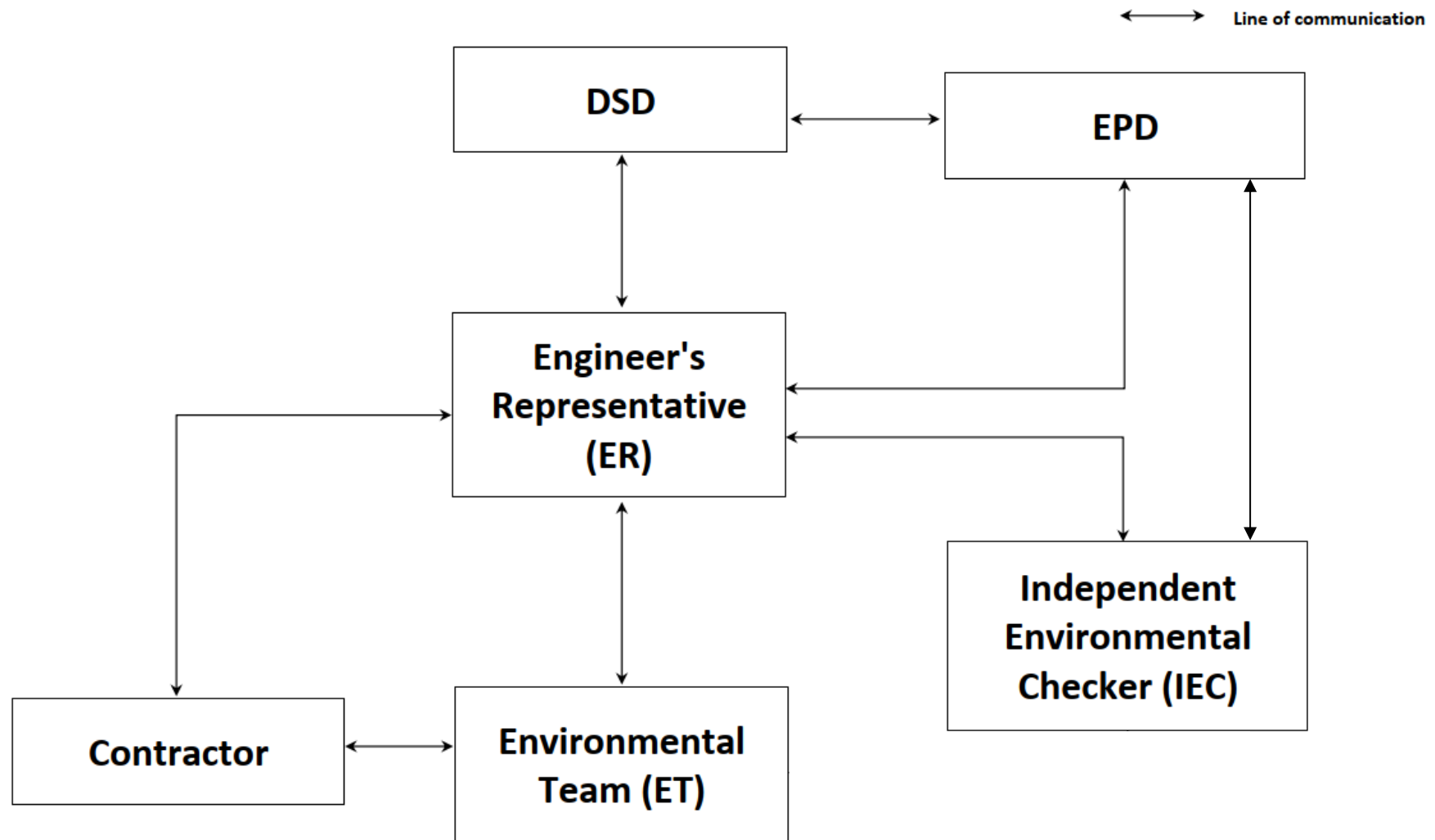
14.5.1 There was no reporting change during the reporting period.

14.6 Notifications of Summons and Successful Prosecutions

14.6.1 There was no notification of summons and successful prosecution was received in the reporting period.

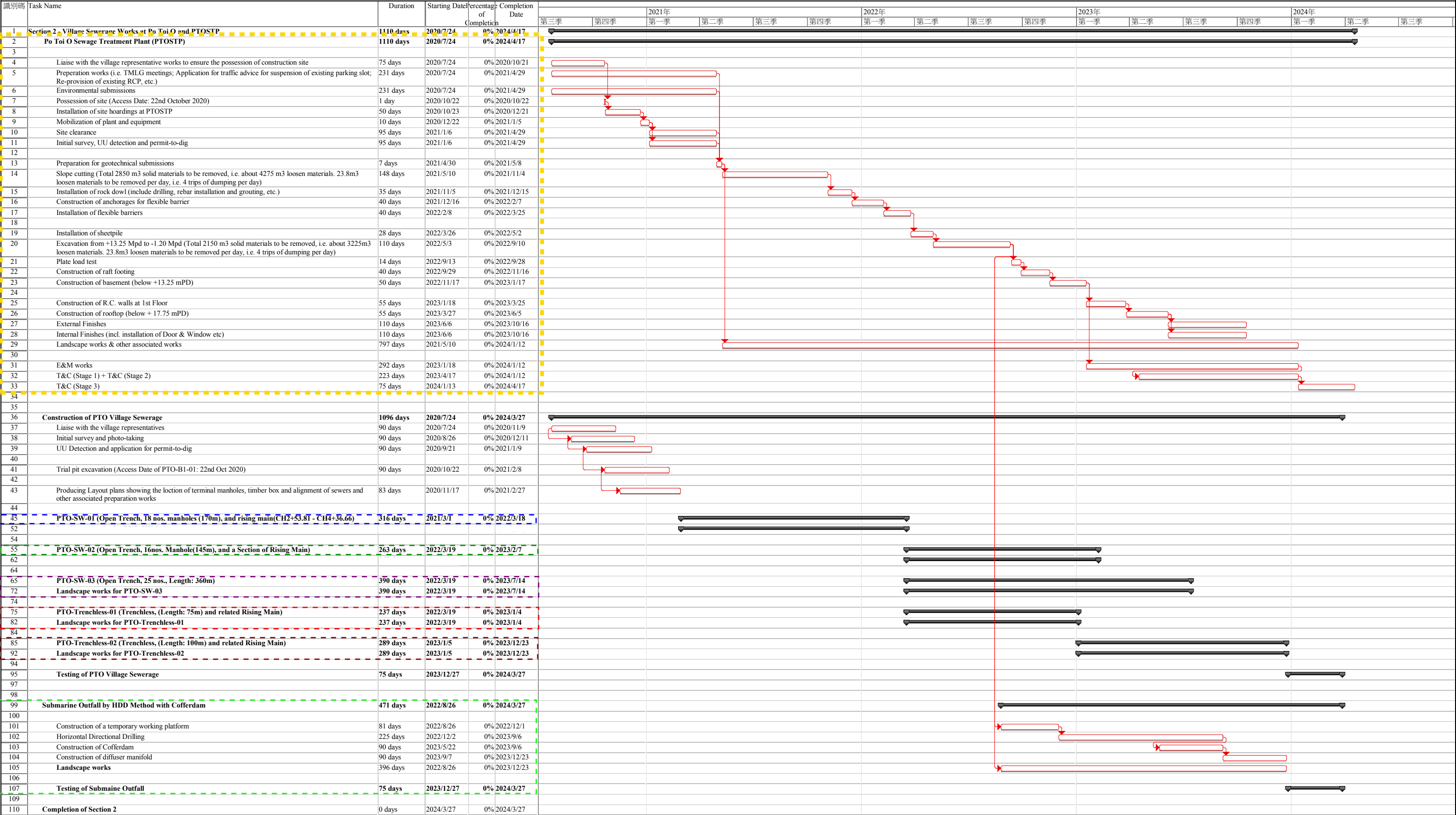
Appendix A

Project Organization Chart



Appendix B

Construction Works Programme

 Summary

Page 1

Appendix C1

1-Hr and 24-Hr TSP Monitoring Result

AEC Project No.: 1825
EP516/2016 - Monthly EM&A Report
Port Shelter Phase 3, Po Toi O Sewage Treatment Plant EM&A
2021/03 1-hour and 24-hours TSP Monitoring Data

Monitoring Location :

AMS-1N

Date	Weather	Wind Speed (m/s)	Wind Direction	1-hour TSP Monitoring				24-hour TSP Monitoring	
					Start Time	Concentration (µg/m³)	Average Concentration (µg/m³)	Start Time	Concentration (µg/m³)
3/3/2021	Cloudy	0.4	15°	1st hr	10:37	57	52	10:37	53
				2nd hr	11:37	49			
				3rd hr	12:37	51			
9/3/2021	Fine	0.2	30°	1st hr	10:27	58	60	10:27	66
				2nd hr	11:27	62			
				3rd hr	12:27	59			
15/3/2021	Sunny	0.2	16°	1st hr	12:59	66	72	09:59	62
				2nd hr	13:59	73			
				3rd hr	14:59	76			
19/3/2021	Fine	0.2	20°	1st hr	15:30	54	56	08:30	36
				2nd hr	16:30	57			
				3rd hr	17:30	58			
25/3/2021	Fine	0.4	49°	1st hr	15:51	81	83	09:51	75
				2nd hr	16:51	82			
				3rd hr	17:51	86			
29/3/2021	Fine	0.9	74°	1st hr	15:21	61	62	10:21	37
				2nd hr	16:21	62			
				3rd hr	17:21	63			
Average :						64	Average :		55
Action Level :						319	Action Level :		158
Limit Level :						500	Limit Level :		260

AEC Project No.: 1825
EP516/2016 - Monthly EM&A Report
Port Shelter Phase 3, Po Toi O Sewage Treatment Plant EM&A
2021/03 1-hour and 24-hours TSP Monitoring Data

Monitoring Location :

AMS-2N1

Date	Weather	Wind Speed (m/s)	Wind Direction	1-hour TSP Monitoring				24-hour TSP Monitoring	
					Start Time	Concentration (µg/m³)	Average Concentration (µg/m³)	Start Time	Concentration (µg/m³)
3/3/2021	Cloudy	0.2	15°	1st hr	15:41	90	95	10:41	87
				2nd hr	16:41	96			
				3rd hr	17:41	98			
9/3/2021	Fine	0.3	15°	1st hr	11:33	75	80	10:33	90
				2nd hr	12:33	83			
				3rd hr	13:33	82			
15/3/2021	Sunny	0.4	23°	1st hr	15:45	69	80	09:45	87
				2nd hr	16:45	76			
				3rd hr	17:45	94			
19/3/2021	Fine	0.3	18°	1st hr	15:45	64	67	09:45	37
				2nd hr	16:45	68			
				3rd hr	17:45	69			
25/3/2021	Fine	0.5	67°	1st hr	15:02	36	42	10:02	38
				2nd hr	16:02	40			
				3rd hr	17:02	51			
29/3/2021	Fine	0.6	72°	1st hr	15:17	52	53	10:17	32
				2nd hr	16:17	51			
				3rd hr	17:17	55			
Average :						69	Average :	62	
Action Level :						279	Action Level :	179	
Limit Level :						500	Limit Level :	260	

AEC Project No.: 1825
EP516/2016 - Monthly EM&A Report
Port Shelter Phase 3, Po Toi O Sewage Treatment Plant EM&A
2021/03 1-hour and 24-hours TSP Monitoring Data

Monitoring Location :

AMS-3N

Date	Weather	Wind Speed (m/s)	Wind Direction	1-hour TSP Monitoring				24-hour TSP Monitoring	
					Start Time	Concentration (µg/m³)	Average Concentration (µg/m³)	Start Time	Concentration (µg/m³)
3/3/2021	Cloudy	0.3	10°	1st hr	15:47	45.2	48	10:47	49
				2nd hr	16:47	45.2			
				3rd hr	17:47	52.5			
9/3/2021	Fine	0.4	15°	1st hr	11:41	87.6	87	10:41	109
				2nd hr	12:41	87.6			
				3rd hr	13:41	84.7			
15/3/2021	Sunny	0.2	8°	1st hr	15:26	93.4	110	09:26	88
				2nd hr	16:26	109.4			
				3rd hr	17:26	127.0			
19/3/2021	Fine	0.2	17°	1st hr	15:15	48.2	58	10:15	41
				2nd hr	16:15	55.5			
				3rd hr	17:15	70.1			
25/3/2021	Fine	0.5	67°	1st hr	15:14	73.0	81	10:14	68
				2nd hr	16:14	83.2			
				3rd hr	17:14	86.1			
29/3/2021	Fine	0.7	46°	1st hr	15:07	45.2	49	10:07	31
				2nd hr	16:07	49.6			
				3rd hr	17:07	52.5			
Average :						72	Average :	64	
Action Level :						303	Action Level :	162	
Limit Level :						500	Limit Level :	260	

AEC Project No.: 1825
EP516/2016 - Monthly EM&A Report
Port Shelter Phase 3, Po Toi O Sewage Treatment Plant EM&A
2021/03 1-hour and 24-hours TSP Monitoring Data
Monitoring Location : AMS-4N

Monitoring Location : _____									
Date	Weather	Wind Speed (m/s)	Wind Direction	1-hour TSP Monitoring				24-hour TSP Monitoring	
					Start Time	Concentration (µg/m³)	Average Concentration n (µg/m³)	Start Time	Concentration n (µg/m³)
3/3/2021	Cloudy	0.6	35°	1st hr	15:58	103	102	10:58	93
				2nd hr	16:58	99			
				3rd hr	17:58	103			
9/3/2021	Fine	0.3	20°	1st hr	15:59	77	87	10:59	98
				2nd hr	16:59	84			
				3rd hr	17:59	99			
15/3/2021	Sunny	0.1	3°	1st hr	15:18	68	84	09:18	56
				2nd hr	16:18	87			
				3rd hr	17:18	96			
19/3/2021	Fine	0.4	7°	1st hr	15:05	49	58	09:05	39
				2nd hr	16:05	58			
				3rd hr	17:05	67			
25/3/2021	Fine	0.7	67°	1st hr	15:38	45	49	09:38	49
				2nd hr	16:38	49			
				3rd hr	17:38	52			
29/3/2021	Fine	0.4	72°	1st hr	15:26	54	56	09:26	37
				2nd hr	16:26	59			
				3rd hr	17:26	56			
						Average :	72	Average :	62
						Action Level :	278	Action Level :	146
						Limit Level :	500	Limit Level :	260

Appendix C2

1-hr and 24-hrs TSP monitoring Data chart

Contract No. EP516/2016

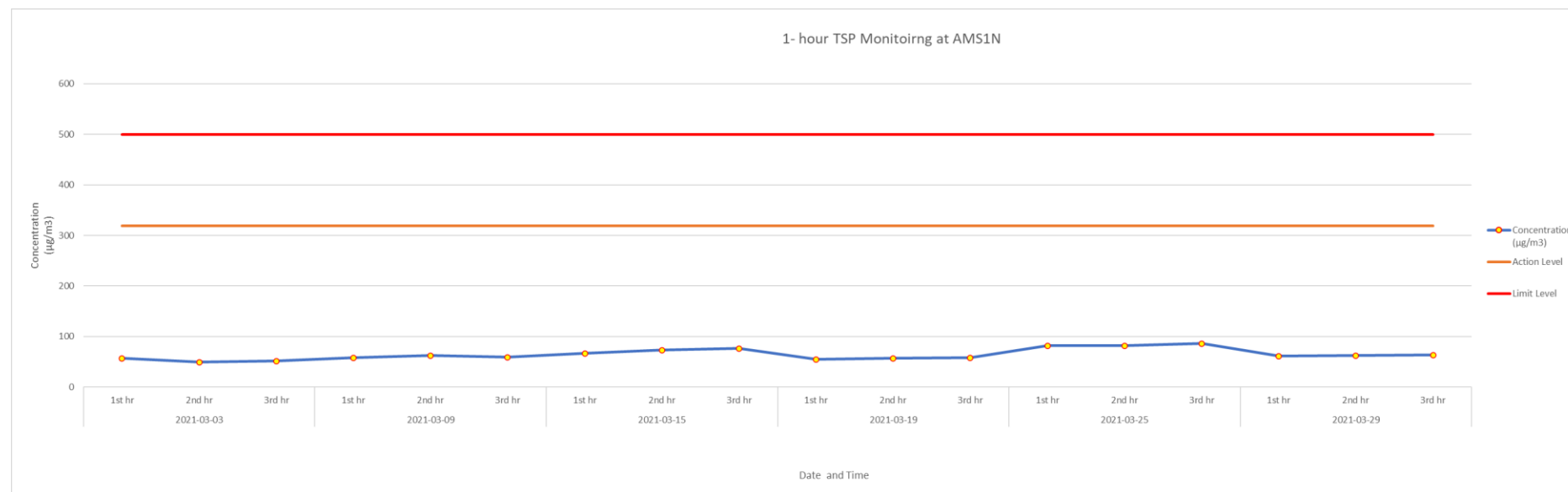
Port Shelter Sewerage, stage 3 – Sewage Works at Po Toi O

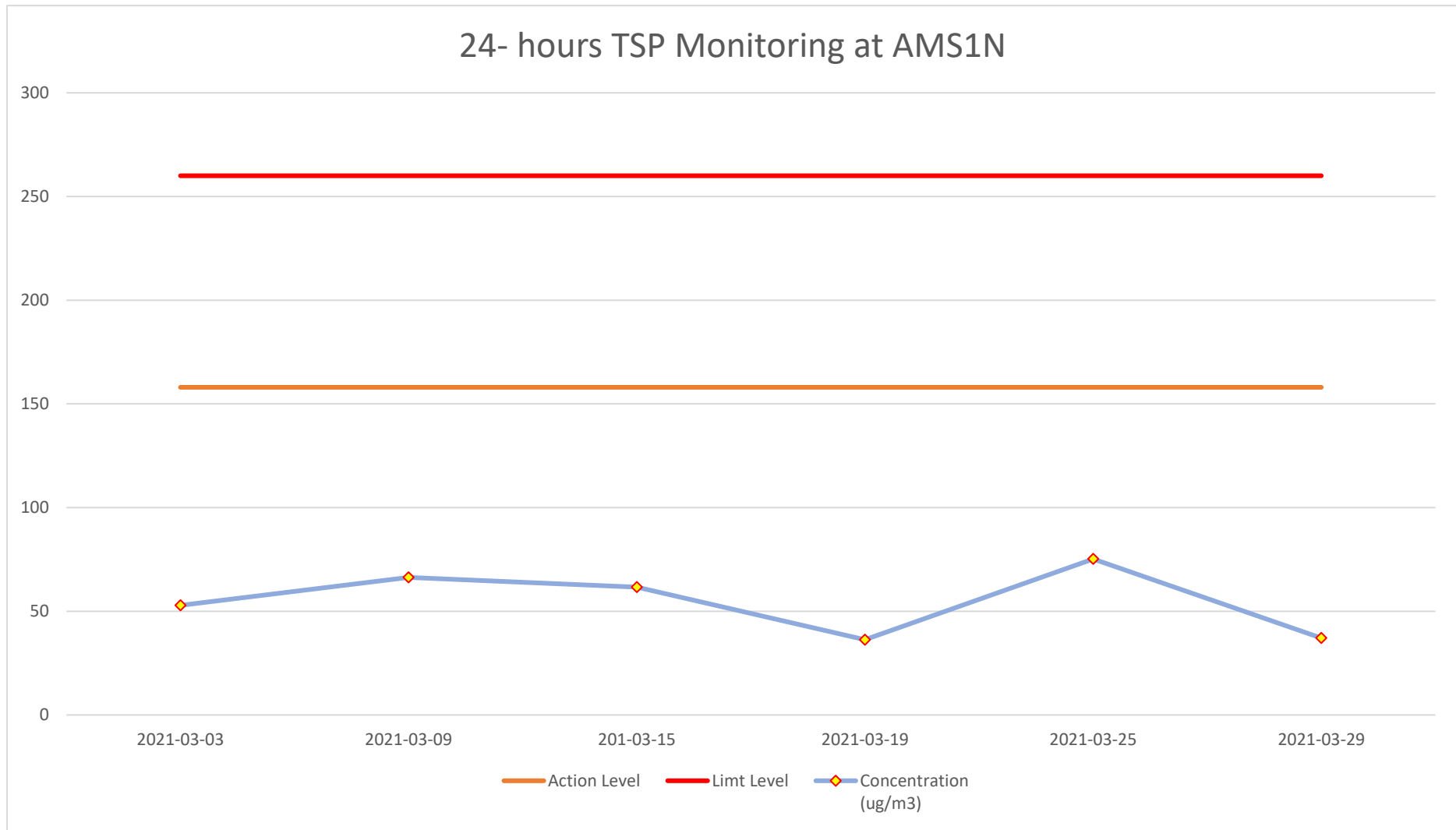
2021/03- 1hour and 24 hours TSP Monitoring Result

Appendix C2 - 1hour and 24 hours TSP Monitoring Result

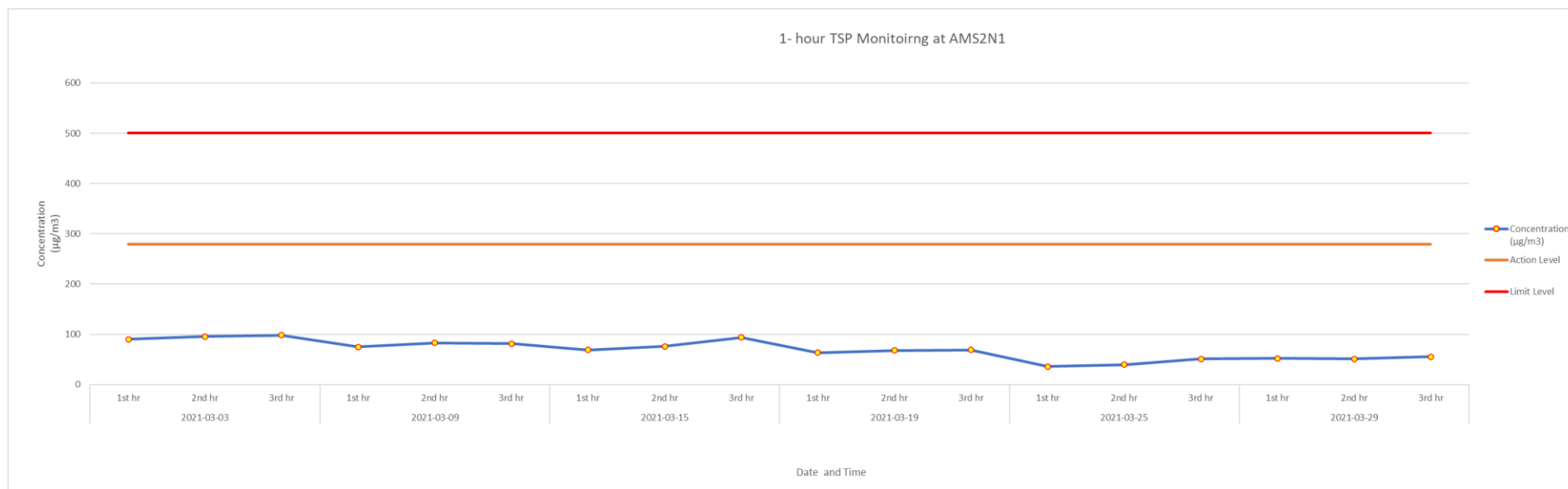
Reporting Month: 2021/03

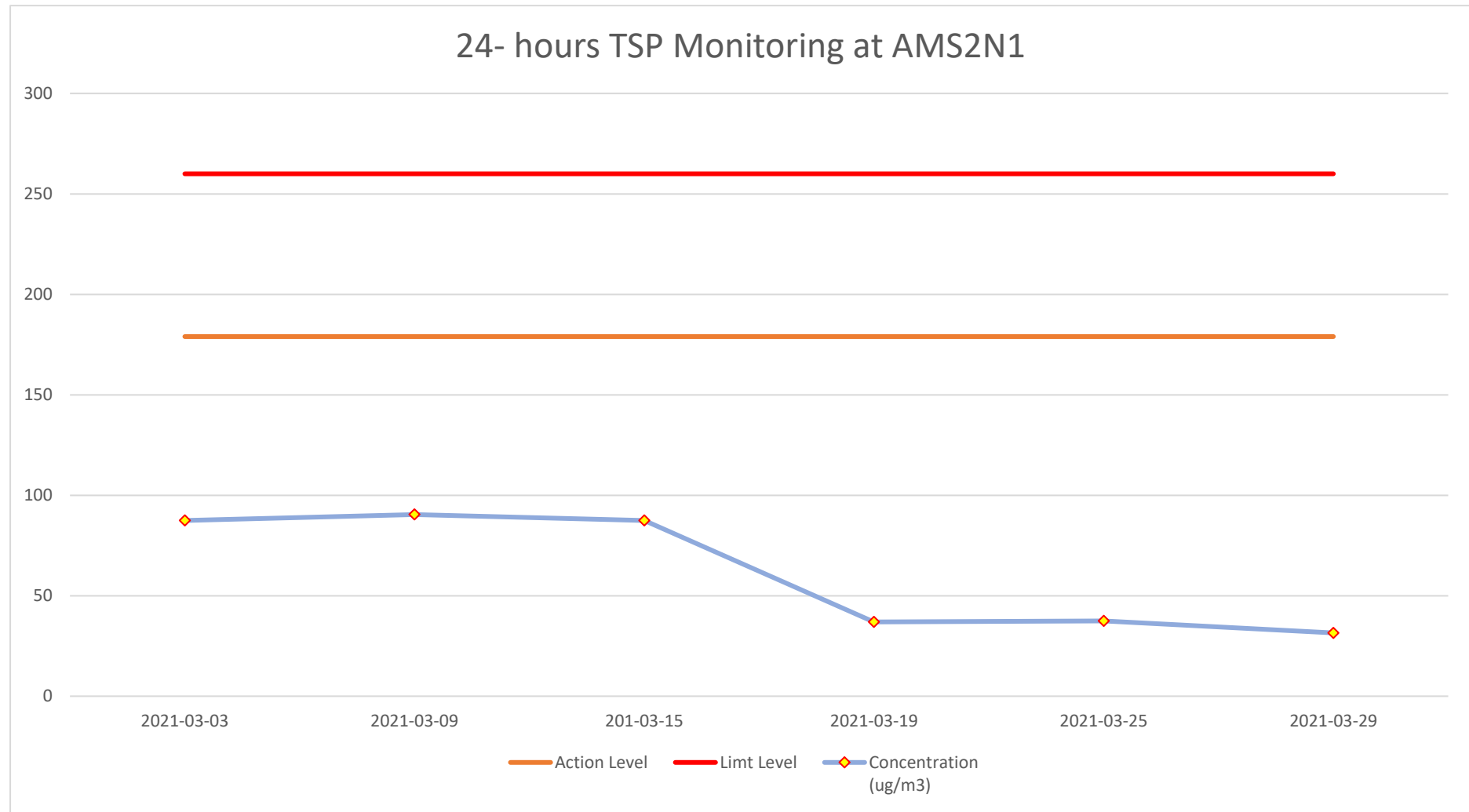
AMS1N – 1 – hour TSP monitoring Chart



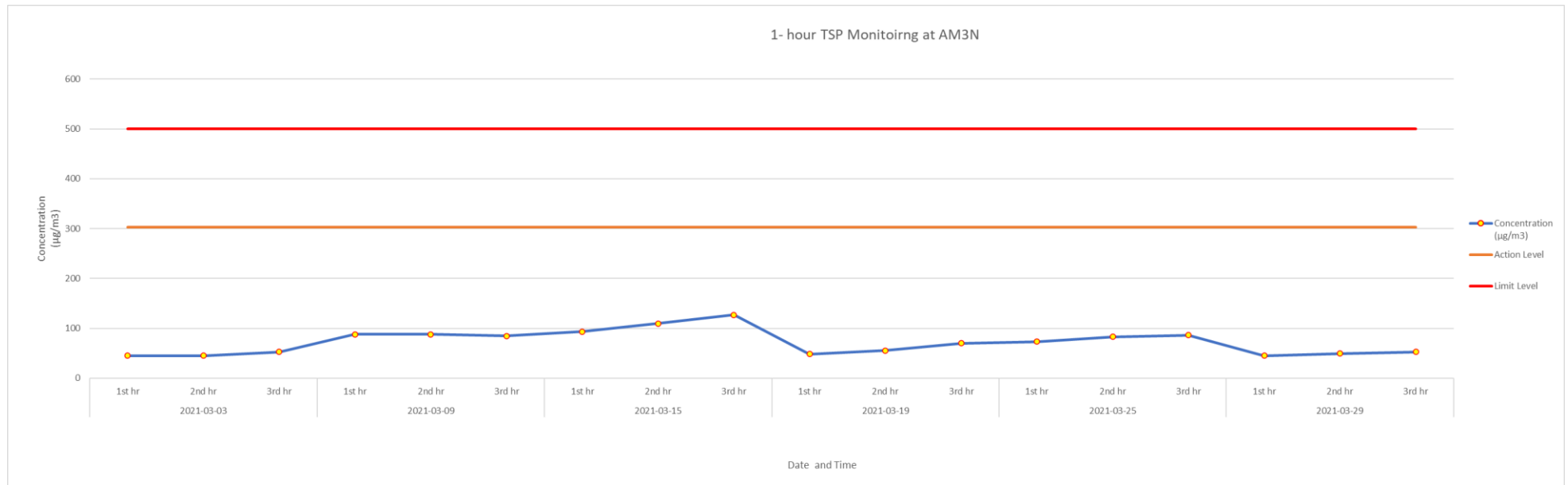


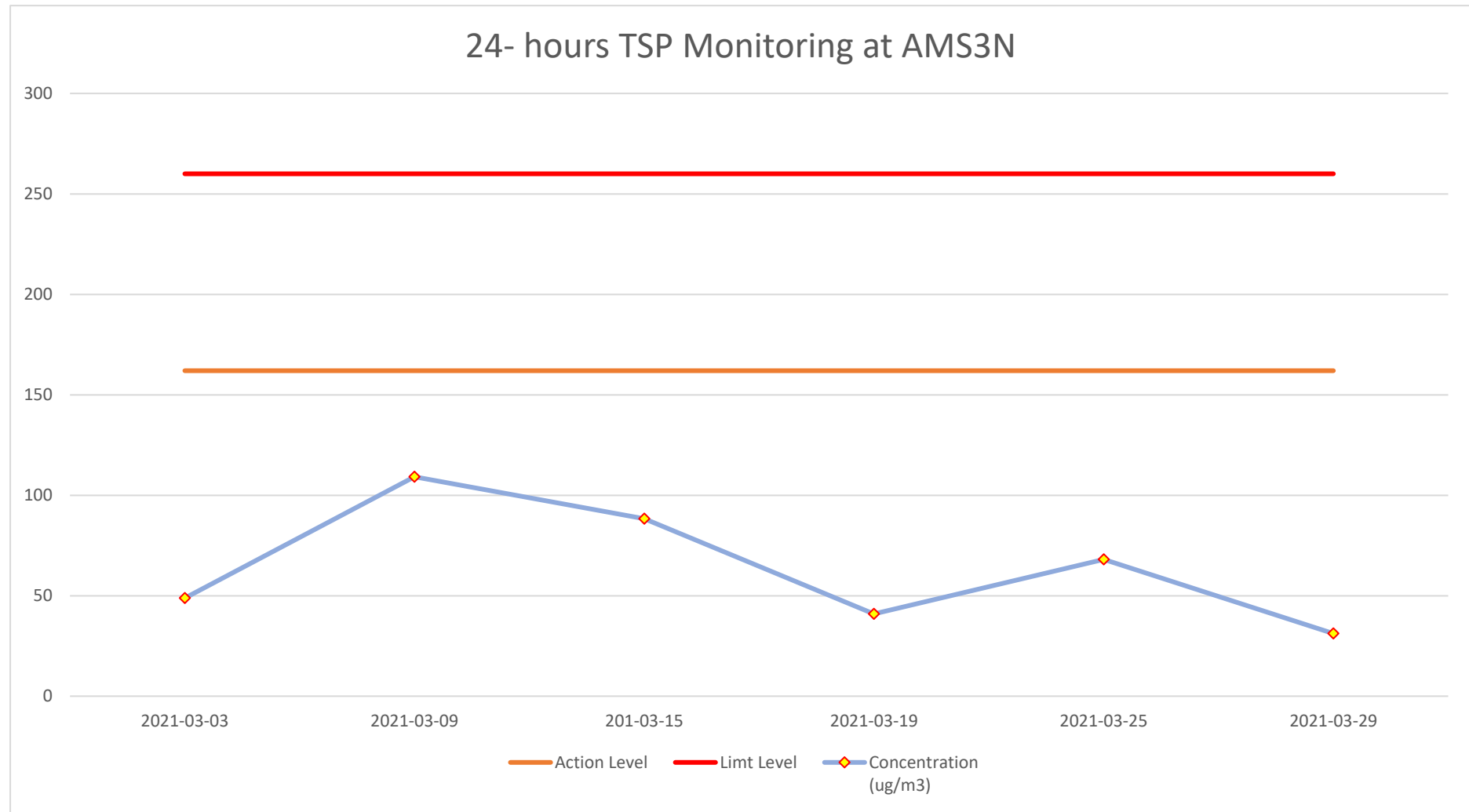
Contract No. EP516/2016
 Port Shelter Sewerage, stage 3 – Sewage Works at Po Toi O
 2021/03- 1hour and 24 hours TSP Monitoring Result
 AMS2N1 – 1 – hour TSP monitoring Chart



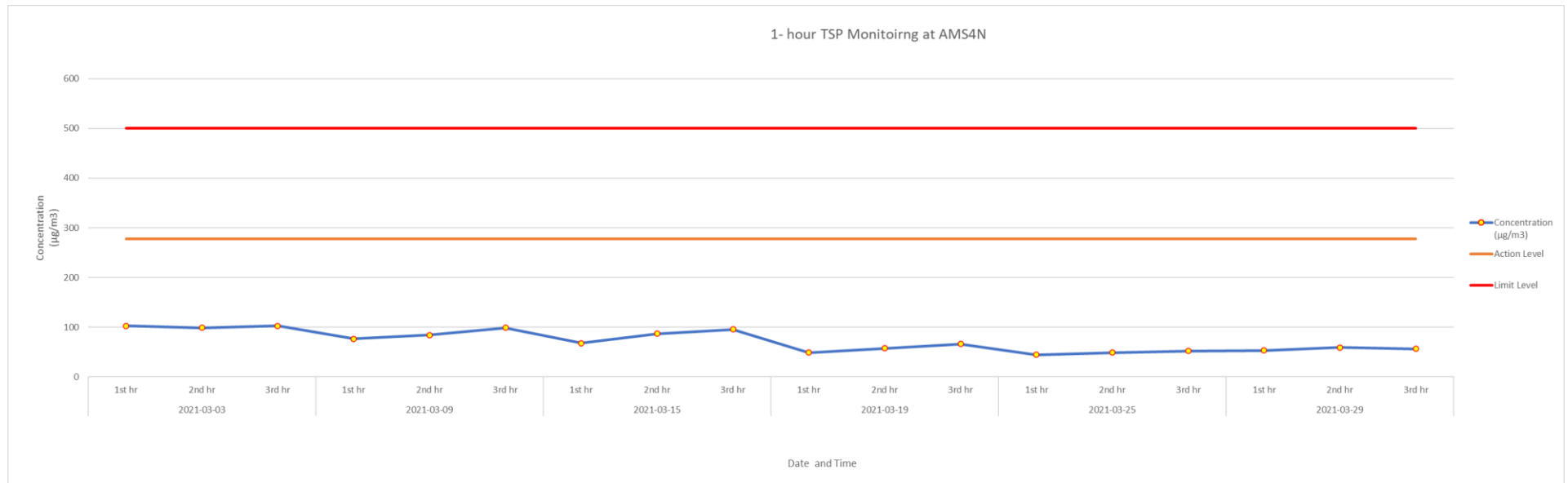


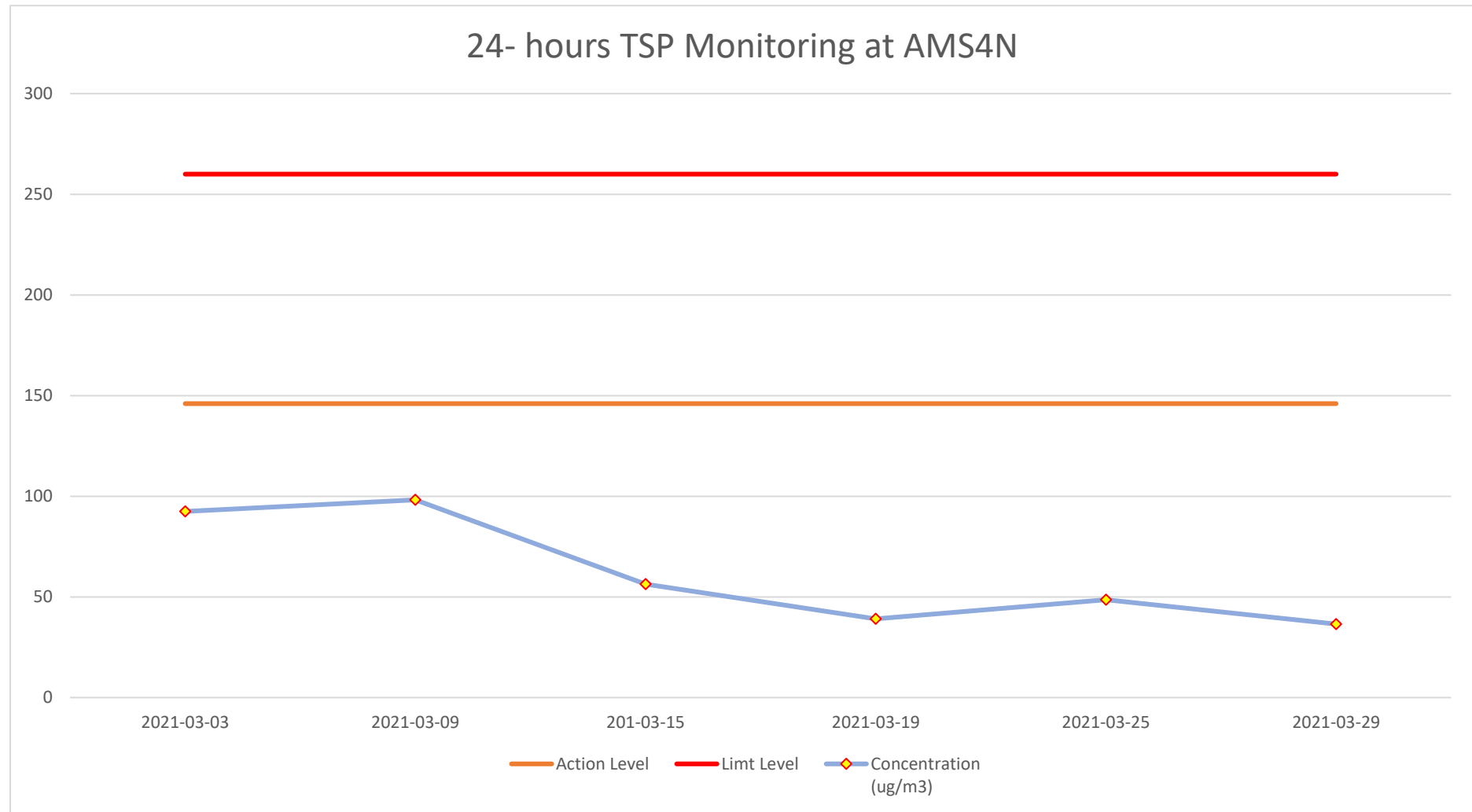
Contract No. EP516/2016
Port Shelter Sewerage, stage 3 – Sewage Works at Po Toi O
2021/03- 1hour and 24 hours TSP Monitoring Result
AMS3N – 1 – hour TSP monitoring Chart





Contract No. EP516/2016
 Port Shelter Sewerage, stage 3 – Sewage Works at Po Toi O
 2021/03- 1hour and 24 hours TSP Monitoring Result
 AMS4N – 1 – hour TSP Monitoring





Appendix C3

Air Quality Monitoring Equipment Calibration Cert

Report no. : 940891CA202793(1)

Page 1 of 1

CALIBRATION CERTIFICATE OF DUST METER

Client : Fugro Technical Services Limited

Project : Calibration Services

Client Supplied Information

Details of Unit Under Test, UUT

Description : Laser dust monitor
 Manufacturer : SIBATA
 Model No. : LD-5R
 Serial No. : 761106
 Specification Limit : NA
 Next Calibration Date : 26-Nov-2021

Laboratory Information

Description : 1. Balance 2. TSP high volume air sampler
 Equipment ID. / Serial no. : 1. C-065-9 2. 4350
 Date of Calibration : 27-Nov-2020 Ambient Temperature : 25 ± 10 °C
 Calibration Location : General Chemical Laboratory of FTS and Ma Wan A1 Site Boundary
 Method Used : By direct comparison the weight of dust particle trapped in a filter paper using high volume sampler (TSP method) for a certain period, with the reading of the UUT. They should be placed at the same location and powered on and off at the same time.

Calibration Results :

Reference concentration (mg/m ³)	Total count for 1 hour	CPM (Count per minute)
0.3486	5134	85.57
0.1257	4394	73.23
0.0943	4408	73.47

Remarks:

1. The equipment being used in this calibration is traceable to recognized National Standards.
2. The interpolation equation : Concentration (mg/m³) = K x [UUT reading (CPM)], where K = 0.002448
3. Correlation coefficient (r) : 0.9916

Checked by : Cherry Date : 30-12-2020 Certified by : K.T. Leung Date : 5-1-2021

CA-R-297 (22/07/2009)

Leung Kwok Tai (Assistant Manager)

**** End of Report ****

Report no. : 940891CA202730(4)

Page 1 of 1

CALIBRATION CERTIFICATE OF DUST METER

Client : Fugro Technical Services Limited

Project : Calibration Services

Client Supplied Information

Details of Unit Under Test, UUT

Description : Laser dust monitor
Manufacturer : SIBATA
Model No. : LD-5R
Serial No. : 620407
Specification Limit : NA
Next Calibration Date : 22-Nov-2021

Laboratory Information

Description : 1. Balance 2. TSP high volume air sampler
Equipment ID. / Serial no. : 1. C-065-9 2. 4350
Date of Calibration : 23-Nov-2020 Ambient Temperature : 25 ± 10 °C
Calibration Location : General Chemical Laboratory of FTS and Ma Wan A1 Site Boundary
Method Used : By direct comparison the weight of dust particle trapped in a filter paper using high volume sampler (TSP method) for a certain period, with the reading of the UUT. They should be placed at the same location and powered on and off at the same time.

Calibration Results :

Reference concentration (mg/m ³)	Total count for 1 hour	CPM (Count per minute)
0.0915	3317	55.28
0.0469	3094	51.57
0.1172	3491	58.18

Remarks:

1. The equipment being used in this calibration is traceable to recognized National Standards.
2. The interpolation equation : Concentration (mg/m³) = K x [UUT reading (CPM)], where K = 0.001549
3. Correlation coefficient (r) : 0.9966

Checked by : Conny Date : 15-12-2020 Certified by : K.T. Leung Date : 15-12-2020

CA-R-297 (22/07/2009)

Leung Kwok Tai (Assistant Manager)

** End of Report **

Report no. : 940891CA202793

Page 1 of 1

CALIBRATION CERTIFICATE OF DUST METER

Client : Fugro Technical Services Limited

Project : Calibration Services

Client Supplied Information

Details of Unit Under Test, UUT

Description : Laser dust monitor
Manufacturer : SIBATA
Model No. : LD-5R
Serial No. : 620408
Specification Limit : NA
Next Calibration Date : 26-Nov-2021

Laboratory Information

Description : 1. Balance 2. TSP high volume air sampler
Equipment ID. / Serial no. : 1. C-065-9 2. 4350
Date of Calibration : 27-Nov-2020 Ambient Temperature : 25 ± 10 °C
Calibration Location : General Chemical Laboratory of FTS and Ma Wan A1 Site Boundary
Method Used : By direct comparison the weight of dust particle trapped in a filter paper using high volume sampler (TSP method) for a certain period, with the reading of the UUT. They should be placed at the same location and powered on and off at the same time.

Calibration Results :

Reference concentration (mg/m ³)	Total count for 1 hour	CPM (Count per minute)
0.3486	5200	86.67
0.1257	4582	76.37
0.0943	4417	73.62

Remarks:

1. The equipment being used in this calibration is traceable to recognized National Standards.
2. The interpolation equation : Concentration (mg/m³) = K x [UUT reading (CPM)], where K = 0.002403
3. Correlation coefficient (r) : 0.9962

Checked by : Cherry Date : 30-12-2020 Certified by : K.T. Leung Date : 5-1-2021

CA-R-297 (22/07/2009)

Leung Kwok Tai (Assistant Manager)

**** End of Report ****

Report no. : 940891CA202730(7)

Page 1 of 1

CALIBRATION CERTIFICATE OF DUST METER

Client : Fugro Technical Services Limited

Project : Calibration Services

Client Supplied Information

Details of Unit Under Test, UUT

Description : Laser dust monitor
Manufacturer : SIBATA
Model No. : LD-5R
Serial No. : 882146
Specification Limit : NA
Next Calibration Date : 22-Nov-2021

Laboratory Information

Description : 1. Balance 2. TSP high volume air sampler
Equipment ID. / Serial no. : 1. C-065-9 2. 4350
Date of Calibration : 23-Nov-2020 Ambient Temperature : 25 ± 10 °C
Calibration Location : General Chemical Laboratory of FTS and Ma Wan A1 Site Boundary
Method Used : By direct comparison the weight of dust particle trapped in a filter paper using high volume sampler (TSP method) for a certain period, with the reading of the UUT. They should be placed at the same location and powered on and off at the same time.

Calibration Results :

Reference concentration (mg/m ³)	Total count for 1 hour	CPM (Count per minute)
0.0915	2788	46.47
0.0469	2287	38.12
0.1172	3129	52.15

Remarks:

1. The equipment being used in this calibration is traceable to recognized National Standards.
2. The interpolation equation : Concentration (mg/m³) = K x [UUT reading (CPM)], where K = 0.001869
3. Correlation coefficient (r) : 0.9990

Checked by : C. Wang Date : 15-12-2020 Certified by : K.T. Leung Date : 15-12-2020
CA-R-297 (22/07/2009) Leung Kwok Tai (Assistant Manager)

** End of Report **

Report No. : 183057CA200894(4)

Page 1 of 1

CALIBRATION CERTIFICATE OF ANEMOMETER**Client Supplied Information**

Client : Fugro Technical Services Ltd.

Project : Calibration Services

Details of Unit Under Test, UUT

Description : Anemometer

Manufacturer : Benetech

Model No. : GM816

Serial No. : N/A

Equipment ID : WS-09

Next Calibration Date : 14-Jun-2021

Laboratory Information

Details of Reference Equipment –

Description : Reference Anemometer

Equipment ID : R-101-4

Date of Calibration : 15-Jun-2020 Ambient Temperature : 22 °C

Calibration Location : Calibration Laboratory of FTS

Method Used : R-C-279

Calibration Results :

Reference Reading (m/s)	UUT Reading (m/s)	Error (m/s)
1.93	2.0	0.1
4.00	4.0	0.0
6.10	6.0	-0.1
8.48	8.0	-0.5
10.81	10.0	-0.8

Remark :

1. The equipment being used in this calibration is traceable to recognized National Standards.
2. The reported readings in this calibration are an average from 10 trials.

Checked by : William Date : 20-6-2020 Certified by : L. T. Young Date : 20-6-2020
CA-R-297 (22/07/2009) Leung Kwok Tai (Assistant Manager)

**** End of Report ****

Appendix C4

HVS Calibration Sheet

TSP SAMPLER CALIBRATION CALCULATION SPREADSHEET

Model:	Tisch TE-5170	Date of Calibration:	22-Feb-21
Serial No.:	4350	Next Calibration Date:	21-Apr-21
		Technician: Addison Wong	

CONDITIONS			
Sea Level Pressure (hPa):	1015.80	Corrected Pressure (mm Hg):	762
Temperature (°C):	21	Temperature (K):	294

CALIBRATION ORIFICE			
Model:	Tisch TE-5025A	Qstd Slope:	2.11508
Serial No.:	2154	Qstd Intercept:	-0.02962
Calibration Date:	11-Sep-20	Expiry Date:	11-Sep-21

CALIBRATIONS							
Plate No.	H2O (L) (in)	H2O (R) (in)	H2O (in)	Qstd (m³/min)	I (chart)	IC (corrected)	LINEAR REGRESSION
18	3.40	-9.10	12.500	1.698	59.00	59.43	Slope = 29.7958 Intercept = 9.3746 Corr. coeff.= 0.9966
13	2.10	-7.90	10.000	1.520	54.00	54.40	
10	1.00	-6.80	7.800	1.344	50.00	50.37	
7	-0.40	-5.40	5.000	1.079	42.00	42.31	
5	-1.30	-4.50	3.200	0.866	34.00	34.25	

Calculations:

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

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

Qstd = standard flow rate

IC = corrected chart response

I = actual chart response

m = calibrator Qstd slope

b = calibrator Qstd intercept

Ta = actual temperature during calibration (deg K)

Pa = actual pressure during calibration (mm Hg)

Tstd = 298 deg K

Pstd = 760 mm Hg

For subsequent calculation of sampler flow:

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

m = sampler slope

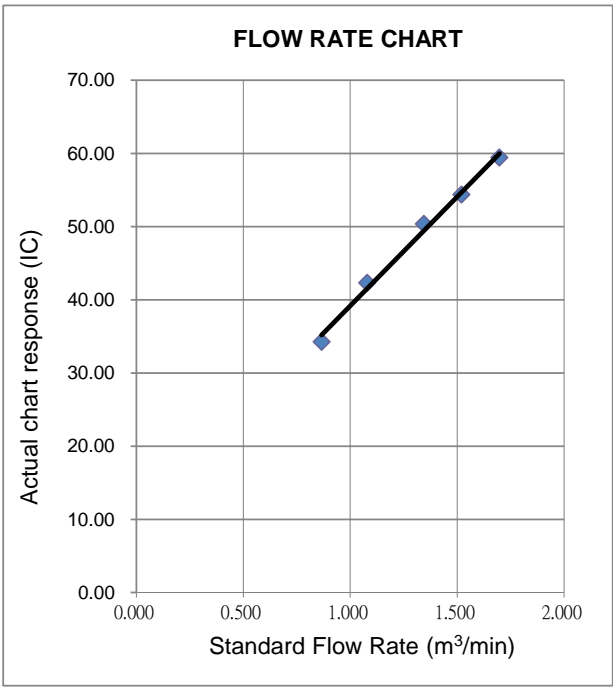
b = sampler intercept

I = chart response

Tav = daily average temperature

Pav = daily average pressure

FLOW RATE CHART



Standard Flow Rate (m³/min)	Actual chart response (IC)
0.866	34.25
1.079	42.31
1.344	50.37
1.520	54.40
1.698	59.43

TSP SAMPLER CALIBRATION CALCULATION SPREADSHEET

Model:	Tisch TE-5170	Date of Calibration:	22-Feb-21
Serial No.:	4374	Next Calibration Date:	21-Apr-21
		Technician: Addison Wong	

CONDITIONS			
Sea Level Pressure (hPa):	1015.80	Corrected Pressure (mm Hg):	762
Temperature (°C):	21	Temperature (K):	294

CALIBRATION ORIFICE			
Model:	Tisch TE-5025A	Qstd Slope:	2.11508
Serial No.:	2154	Qstd Intercept:	-0.02962
Calibration Date:	11-Sep-20	Expiry Date:	11-Sep-21

CALIBRATIONS							
Plate No.	H2O (L) (in)	H2O (R) (in)	H2O (in)	Qstd (m³/min)	I (chart)	IC (corrected)	LINEAR REGRESSION
18	4.90	-5.00	9.900	1.513	57.00	57.42	Slope = 31.5901 Intercept = 8.6863 Corr. coeff.= 0.9956
13	4.70	-4.80	9.500	1.482	54.00	54.40	
10	3.70	-3.90	7.600	1.327	50.00	50.37	
7	2.00	-2.00	4.000	0.967	40.00	40.29	
5	1.50	-1.00	2.500	0.767	32.00	32.24	

Calculations:

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

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

Qstd = standard flow rate

IC = corrected chart response

I = actual chart response

m = calibrator Qstd slope

b = calibrator Qstd intercept

Ta = actual temperature during calibration (deg K)

Pa = actual pressure during calibration (mm Hg)

Tstd = 298 deg K

Pstd = 760 mm Hg

For subsequent calculation of sampler flow:

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

m = sampler slope

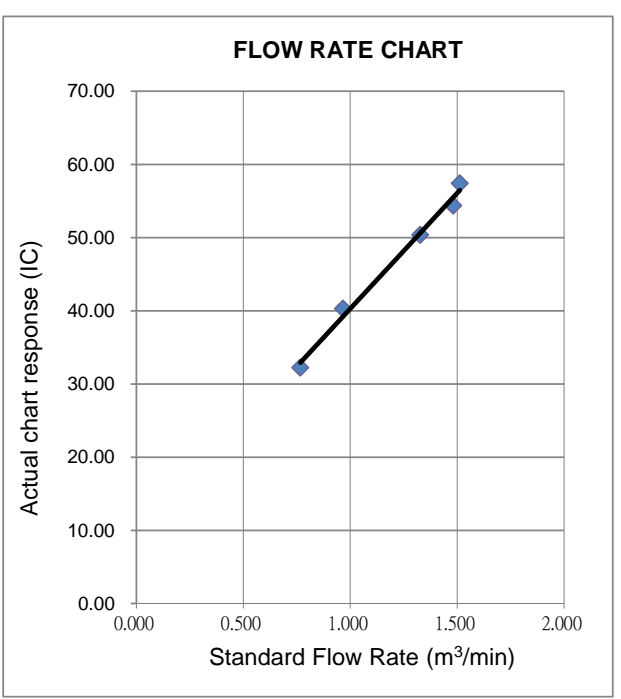
b = sampler intercept

I = chart response

Tav = daily average temperature

Pav = daily average pressure

FLOW RATE CHART



Standard Flow Rate (m³/min)	Actual chart response (IC)
0.767	32.24
0.967	40.29
1.327	50.37
1.513	57.42

TSP SAMPLER CALIBRATION CALCULATION SPREADSHEET

Model:	Tisch TE-5170	Date of Calibration:	22-Feb-21
Serial No.:	2089	Next Calibration Date:	21-Apr-21
		Technician: Yin Ho	

CONDITIONS			
Sea Level Pressure (hPa):	1015.80	Corrected Pressure (mm Hg):	762
Temperature (°C):	21	Temperature (K):	294

CALIBRATION ORIFICE			
Model:	Tisch TE-5025A	Qstd Slope:	2.11508
Serial No.:	2154	Qstd Intercept:	-0.02962
Calibration Date:	11-Sep-20	Expiry Date:	11-Sep-21

CALIBRATIONS							
Plate No.	H2O (L) (in)	H2O (R) (in)	H2O (in)	Qstd (m³/min)	I (chart)	IC (corrected)	LINEAR REGRESSION
18	11.70	3.00	8.700	1.419	57.00	57.42	Slope = 43.6044 Intercept = -3.7865 Corr. coeff.= 0.9916
13	10.90	3.80	7.100	1.283	52.00	52.38	
10	10.20	4.50	5.700	1.151	48.00	48.35	
7	9.70	5.00	4.700	1.047	40.00	40.29	
5	8.80	5.90	2.900	0.825	32.00	32.24	

Calculations:

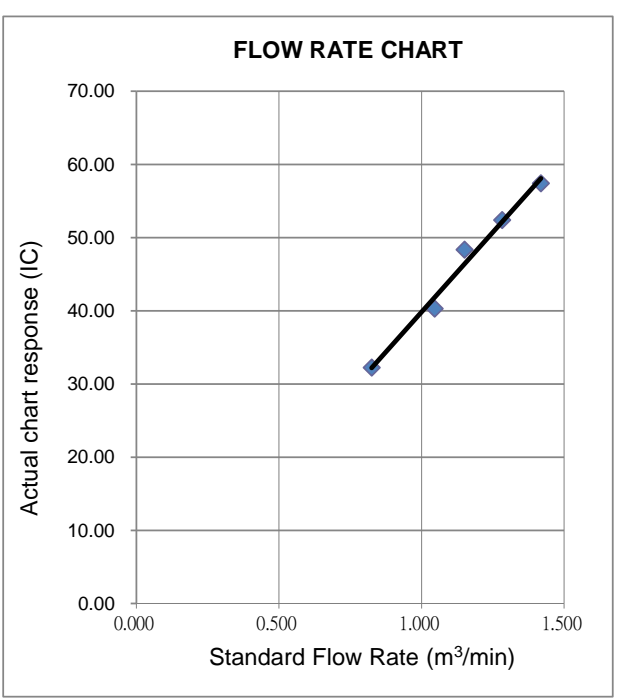
Qstd = 1/m[Sqrt(H2O(Pa/Pstd)(Tstd/Ta))-b]
 IC = I[Sqrt(Pa/Pstd)(Tstd/Ta)]

Qstd = standard flow rate
 IC = corrected chart response
 I = actual chart response
 m = calibrator Qstd slope
 b = calibrator Qstd intercept
 Ta = actual temperature during calibration (deg K)
 Pa = actual pressure during calibration (mm Hg)
 Tstd = 298 deg K
 Pstd = 760 mm Hg

For subsequent calculation of sampler flow:
 $1/m((I)[\text{Sqrt}(298/T_{\text{av}})(P_{\text{av}}/760)]-b)$

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

FLOW RATE CHART



Standard Flow Rate (m³/min)	Actual chart response (IC)
0.825	32.24
1.047	40.29
1.151	48.35
1.283	52.38
1.419	57.42

TSP SAMPLER CALIBRATION CALCULATION SPREADSHEET

Model:	Tisch TE-5170	Date of Calibration:	22-Feb-21
Serial No.:	3796	Next Calibration Date:	21-Apr-21
		Technician:	Yin Ho

CONDITIONS			
Sea Level Pressure (hPa):	1015.80	Corrected Pressure (mm Hg):	762
Temperature (°C):	21	Temperature (K):	294

CALIBRATION ORIFICE			
Model:	Tisch TE-5025A	Qstd Slope:	2.11508
Serial No.:	2154	Qstd Intercept:	-0.02962
Calibration Date:	11-Sep-20	Expiry Date:	11-Sep-21

CALIBRATIONS							
Plate No.	H2O (L) (in)	H2O (R) (in)	H2O (in)	Qstd (m³/min)	I (chart)	IC (corrected)	LINEAR REGRESSION
18	11.70	3.00	8.700	1.419	56.00	56.41	Slope = 36.8785 Intercept = 3.8145 Corr. coeff.= 0.9905
13	10.80	3.90	6.900	1.265	50.00	50.37	
10	10.10	4.60	5.500	1.131	46.00	46.34	
7	9.50	5.30	4.200	0.990	38.00	38.28	
5	8.70	6.00	2.700	0.797	34.00	34.25	

Calculations:

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

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

Qstd = standard flow rate

IC = corrected chart response

I = actual chart response

m = calibrator Qstd slope

b = calibrator Qstd intercept

Ta = actual temperature during calibration (deg K)

Pa = actual pressure during calibration (mm Hg)

Tstd = 298 deg K

Pstd = 760 mm Hg

For subsequent calculation of sampler flow:

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

m = sampler slope

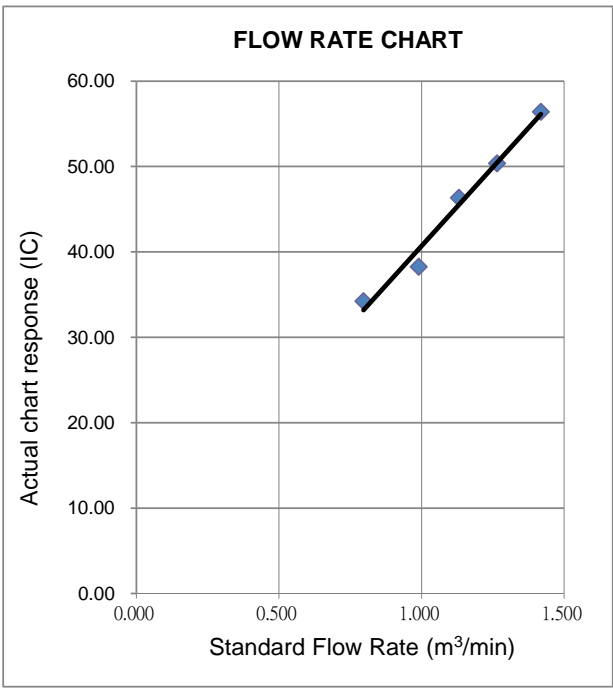
b = sampler intercept

I = chart response

Tav = daily average temperature

Pav = daily average pressure

FLOW RATE CHART



Standard Flow Rate (m³/min)	Actual chart response (IC)
0.797	34.25
0.990	38.28
1.131	46.34
1.265	50.37
1.419	56.41

Appendix C5

Correlation Methodology between Potable laser dust meter and HVS

1. Correlation between Portable laser dusty meter and High-volume Sampler Methodology

1.1. Correlation results between the direct reading meter and High-Volume Sampler

High – Volume Sampler Calibration

- 1.1.1. The specification, a sample of calibration certificate and certificate of comparison check with High volume sampler of the proposed air quality monitoring equipment listed in Table 2.1 are attached in appendix.
- 1.1.2. The High-Volume air sampler calibration procedure based on the requirement of manufacturer are shown below.
 - (a) Disconnect the sampler motor from the mass flow controller and connect the motor to a stable AC power source.
 - (b) Mount the calibrator orifice and top loading adapter plate to the sampler. A sampling filter is generally not used during this procedure. Tighten the top loading adapter hold down nuts securely to ensure that no air leaks are present.
 - (c) Allow the sampler motor to warm up to its normal operating temperature
 - (d) (approximately 10-15 minutes).
 - (e) Conduct a leak test by covering the hole(s) on top of the orifice and pressure tap on the orifice with your hands. Listen for a high-pitched squealing sound made by escaping air. If this sound is heard, a leak is present and the top loading adapter hold-down nuts need to be re-tightened. If the sound is lower, the leak is near one of the other gaskets in the system. Avoid running the sampler for longer than 30 seconds at a time with the orifice blocked to avoid overheating the motor. Do not perform this leak test procedure with a manometer connected to the side tap on the calibration orifice or the blower motor. Liquid from the manometer could be drawn into the system and cause motor damage.
 - (f) Connect one side of a water manometer to the pressure tap on the side of the orifice with a rubber vacuum tube. Leave the opposite side of the manometer open to the

atmosphere. Note: Both valves on the manometer have to be open for the liquid to flow freely. One side of the 'U' tube goes up the other goes down; add together for the "H₂O reading.

- (g) A manometer must be held vertically to ensure accurate readings. Tapping the backside of the continuous flow recorder will help to center the pen and provide accurate readings. When using a variable orifice, five flow rates are achieved in this step by adjusting the knob on the variable orifice to five different positions and taking five different readings.
- (h) Record the ambient air temperature, the ambient barometric pressure, the sampler serial number, the orifice s/n, the orifice slope and intercept with date last certified, today's date, site location and the operators initials on the attached blank calibration sheet.
- (i) An example of a Lead (or TSP) Sampler Calibration Data Sheet has been attached with data filled in from a typical calibration. This includes the transfer standard orifice calibration relationship which was taken from the Orifice Calibration Worksheet that accompanies the calibrator orifice.

Disconnect the sampler motor from its power source and remove the orifice and top loading adapter plate. Re-connect the sampler motor to the electronic mass flow controller.

- 1.1.3. Since this calibration is for a TSP sampler, the slope and intercept for this orifice uses standard flows rather than actual flows and is taken from the Q_{standard} section of the Orifice Calibration Worksheet. The Q_{actual} flows are only used when calibrating a PM-10 sampler.
- 2.3.4 The five orifice manometer readings taken during the calibration have been recorded in the column on the data worksheet titled Orifice "H₂O". The five continuous flow recorder readings taken during the calibration have been recorded under the column titled I chart.

- 2.3.5 The orifice manometer readings need to be converted to the standard air flows they represent using the following equation:

$$Q_{std} = 1/m[\text{Sqrt}((H_2O)(P_a/760)(298/T_a))-b]$$

where:

Q_{std} = actual flow rate as indicated by the calibrator orifice, m³/min

H_2O = orifice manometer reading during calibration, "H₂O

T_a = ambient temperature during calibration, K (K = 273 + °C)

298 = standard temperature, a constant that never changes, K

P_a = ambient barometric pressure during calibration, mm Hg

760 = standard barometric pressure, a constant that never changes, mm Hg

m = *Q*standard slope of orifice calibration relationship

b = *Q*standard intercept of orifice calibration relationship.

- 2.3.6 Once these standard flow rates have been determined for each of the five run points, they are recorded in the column titled Q_{std} , and are represented in cubic meters per minute.
- 2.3.7 Once these standard flow rates have been determined for each of the five run points, they are recorded in the column titled Q_{std} , and are represented in cubic meters per minute

- 2.3.8 The continuous flow recorder readings taken during the calibration need to be corrected to the current meteorological conditions using the following equation:

$$IC = I[\text{Sqrt}((Pa/760)(298/Ta))]$$

where:

IC = continuous flow recorder readings corrected to current Ta and Pa

I = continuous flow recorder readings during calibration

Pa = ambient barometric pressure during calibration, mm Hg.

760 = standard barometric pressure, a constant that never changes, mm Hg

Ta = ambient temperature during calibration, K (K = 273 + °C)

298 = standard temperature, a constant that never changes, K

- 2.3.9 After each of the continuous flow recorder readings have been corrected, they are recorded in the column titled IC (corrected).
- 2.3.10 Using Qstd and IC (or FLOW (corrected)) as the x and y axis respectively, a slope, intercept, and correlation coefficient can be calculated using the least squares regression method. The correlation coefficient should never be less than 0.990 after a five-point calibration. A coefficient below .990 indicates a calibration that is not linear and the calibration should be performed again. If this occurs, it is most likely the result of an air leak during the calibration or high wind speed during the calibration procedure.
- 2.3.11 The equations for determining the slope (m) and intercept (b) are as follows:

$$m = \frac{\frac{(\sum x)(\sum y)}{\sum xy - \frac{n}{n}}}{\frac{(\sum x)^2}{\sum x^2 - \frac{n}{n}}} ; \quad b = \bar{y} - m\bar{x}$$

The equation for the coefficient of correlation (r) is as follows:

$$r = \frac{\sum xy - \frac{(\sum x)(\sum y)}{n}}{\sqrt{\left[\sum x^2 - \frac{(\sum x)^2}{n} \right] \left[\sum y^2 - \frac{(\sum y)^2}{n} \right]}}$$

where: n = number of observations
 \sum = sum of

- 2.3.12 The acceptable operating flow range of a TSP sampler is 1.1 to 1.7 m³/min (39 to 60 CFM). Looking at the worksheet column Qstd(see page 38), the flow rates that are within this range can be identified along with the chart reading (I) that represents them. For instance, if you wanted to set this sampler at 1.265 m³/min (44.67 CFM) (Make sure the mass flow controller is plugged in and a filter is in place) you would turn the Flow Adjustment screw until the continuous flow recorder read 37 on the chart. By making sure that the sampler is operating at a chart reading (or manometer reading) that is within the acceptable range, it can be assumed that valid TSP data is being collected.
- 2.3.13 A calibration that has a correlation coefficient of less than .990 is not considered linear and should be re-calibrated. Therefore, if $r < 0.990$, return all the points or only the point with the greatest deviation and the recalculate.
- 2.3.14 The 24-hour TSP levels to be measured by direct reading methods, utilising portable Laser Particle Photometer Monitors (Sibata Model LD-3B/5R), in place of High-Volume Sampler (HVS) if HVS experience difficulties in operation during monitoring. It is demonstrated by the previous project experiences, that 24-hour TSP monitoring results collected by direct reading method are comparable to those produced by the high-volume sampling method, to indicate short event impacts. The projects utilising the collection of 24-hour TSP levels data by direct reading methods are shown below.

Project Reference for utilising the collection of 24-hour TSP levels data by direct reading methods

Project Contract Number	Location	Status
NDO 03/2018	Road Widening and Retrofitting Noise Barriers on Tai Po Road (Sha Tin Section)	On-going
NDO 14/2018	Advance and First Stage Works of Kwu Tung North and Fanling North New Development Areas	On-going

2.3.15 Calculation of the value of 24-hour TSP concentration is given by the average of 24 calculated 1-hour TSP concentration, where the calculated 1-hr TSP concentration is given by the product of the direct reading and the K-factor based on the correlation results between the direct reading meter and High-Volume Sampler.

2.3.16 The correlation results between the direct reading meter and High-Volume Sampler shall be review with bimonthly internal calibration. To maintain the correlation with two sets of data (monitoring data from HVS and monitoring data from Portable Laser Particle Photometer Monitors) bimonthly internal calculated are strongly linked together two sets of data.

2.3.17 To protect the dust meter from being damaged and to operate without disturbances or nuisance, temporary barriers shall be erected around the monitoring equipment during the monitoring period. Temporary barriers will be placed approx. 0.5m away from the dust meter.

Maintenance/ Calibration for the High-Volume Sampler (HVS) being correlation

2.3.18 The HVS shall be calibrated bimonthly in accordance to the specification in the manufacturer's manual. The calibration certificates shall be available to the IEC for checking upon request. The validity and accuracy of the HVS shall also be tested against the result by the TE-5025A Calibration Kit periodically, Details of Calibration Cert and Specification for HVS- 5170 and HVS- Calibration Kit TE-5025A are given in Appendix 2-1 and Appendix 2-3.

2.3.19 Tisch TE-5170 is chosen as the HVS for 24-hour TSP monitoring and Tisch TE – 5025A is chosen as the HVS Calibration-Kit for HVS calibration.

2.3.20 The high-volume motors and their accessories should be properly maintained. Appropriate maintenance such as routine motor brushes replacement and electrical wiring checking should be made to ensure that the equipment and necessary power supply were in good working condition.

Appendix C6

SIBATA & HVS Correlation Record

Correlation between HVS & Dust Meter

Date of Correlation: 23 February 2021

Date of Next Correlation: 22 April 2021

Laser dust monitor Information

Model: Sibata LD-5R

Serial No: 761106

Date of Calibration: 23 February 2021

Date of Next Calibration: 22 April 2021

High Volume Sampler (HVS) Information

Model: Tisch TE-5170

Serial No: 4350

Baseline Monitoring Location ID: AMS-1N

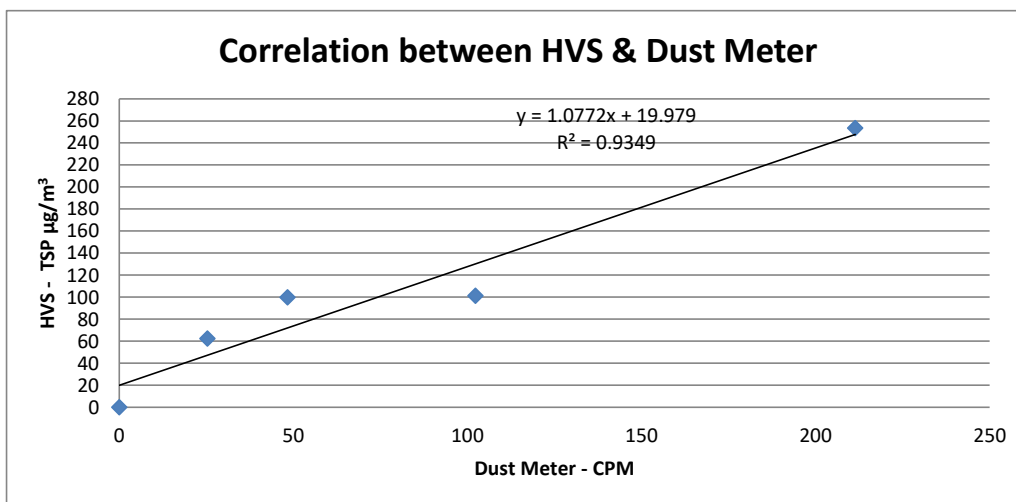
Baseline Monitoring Location: Footpath above House No. 28 Po Toi O Tsuen Road

Ambient Temperature: 20.7 °C

Method Used: By direct comparison the weight of dust particle trapped in a filter paper using HVS (TSP method) for a certain period, with the reading of the Unit under test. They should be placed at the same location and powered on and off at the same time.

Calibraion Results:

HVS - TSP $\mu\text{g}/\text{m}^3$	62.5	99.8	101.3	253.5
Dust Meter - CPM	25	48	102	211



Remarks:

1. K-Factor (x) = $1.0772x + 19.979$
2. Correlation coefficient (r) = 0.9349

Correlation between HVS & Dust Meter

Date of Correlation: 23 February 2021

Date of Next Correlation: 22 April 2021

Laser dust monitor Information

Model: Sibata LD-5R

Serial No: 620407

Date of Calibration: 23 February 2021

Date of Next Calibration: 22 April 2021

High Volume Sampler Information

Model: Tisch TE-5170

Serial No: 4374

Baseline Monitoring Location ID: AMS-2N1

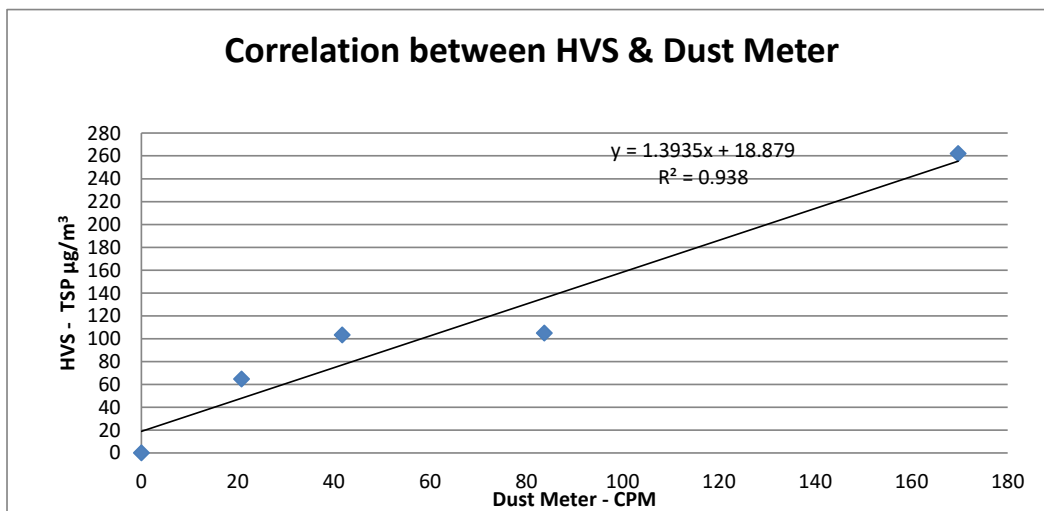
Baseline Monitoring Location: Open Space Approx. 15m from Hung Shing Temple

Ambient Temperature: 20.7 °C

Method Used: By direct comparison the weight of dust particle trapped in a filter paper using HVS (TSP method) for a certain period, with the reading of the Unit under test. They should be placed at the same location and powered on and off at the same time.

Calibration Results

Calibration Results:	64.5	103.3	105	262
Dust Meter - CPM	20.8	41.7	83.7	169.7



Remarks:

1. K-Factor (x) = $1.3935x + 18.879$

2. Correlation coefficient (r) = 0.938

Correlation between HVS & Dust Meter

Date of Correlation: 23 February 2021

Date of Next Correlation: 22 April 2021

Laser dust monitor Information

Model: Sibata LD-5R

Serial No: 620408

Date of Calibration: 23 February 2021

Date of Next Calibration: 22 April 2021

High Volume Sampler Information

Model: Tisch TE-5170

Serial No: 2089

Baseline Monitoring Location ID: AMS-3N

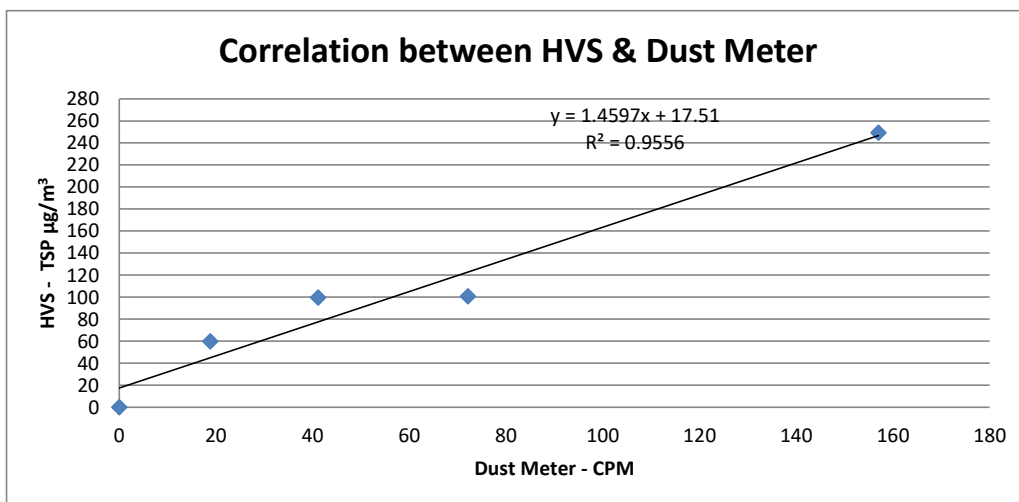
Baseline Monitoring Location: Vacant land near Temporary Structure (House) near Rocky Shore

Ambient Temperature: 20.7 °C

Method Used: By direct comparison the weight of dust particle trapped in a filter paper using HVS (TSP method) for a certain period, with the reading of the Unit under test. They should be placed at the same location and powered on and off at the same time.

Calibraion Results

Calibraion Results:	59.8	99.6	101	249.2
Dust Meter - CPM	18.8	41.1	72.1	157.0



Remarks:

1. K-Factor (x) = $1.4597x + 17.51$

2. Correlation coefficient (r) = 0.9556

Correlation between HVS & Dust Meter

Date of Correlation: 23 February 2021

Date of Next Correlation: 22 April 2021

Laser dust monitor Information

Model: Sibata LD-5R

Serial No: 882146

Date of Calibration: 23 February 2021

Date of Next Calibration: 22 April 2021

High Volume Sampler Information

Model: Tisch TE-5170

Serial No: 3796

Baseline Monitoring Location ID: AMS-4N

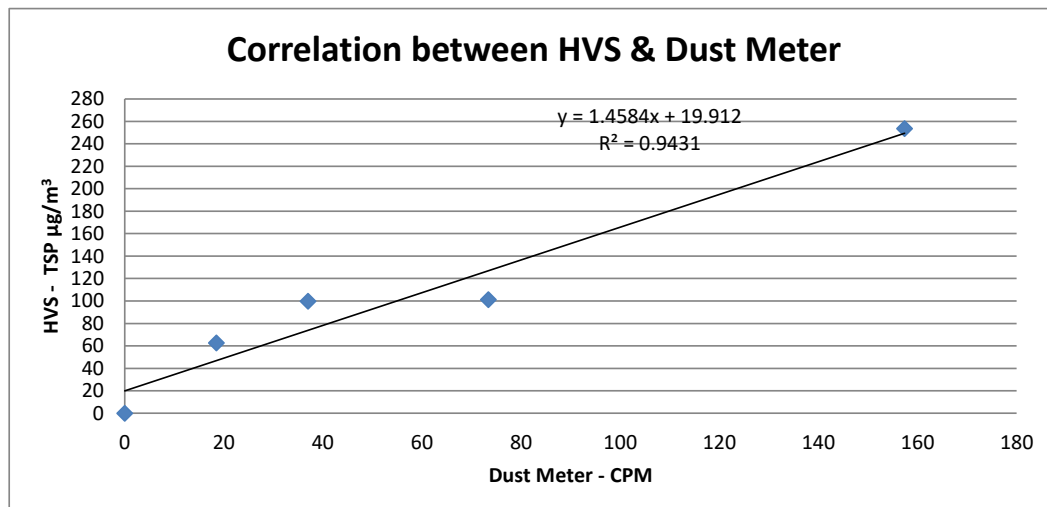
Baseline Monitoring Location: Resting shelter near Seacrest Villas

Ambient Temperature: 20.7 °C

Method Used: By direct comparison the weight of dust particle trapped in a filter paper using HVS (TSP method) for a certain period, with the reading of the Unit under test. They should be placed at the same location and powered on and off at the same time.

Calibraion Results

Calibraion Results:	62.5	99.8	101	253.5
Dust Meter - CPM	18.5	37.0	73.4	157.4



Remarks:

1. K-Factor (x) = $1.4584x + 19.912$

2. Correlation coefficient (r) = 0.9431

Appendix C7

Event and Action Plan for Air Quality Monitoring

Appendix C7 - Event and Action Plan for Construction Dust Monitoring

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

	ACTION		ACTION	
EVENT	ET	EVENT	ET	EVENT
LIMIT LEVEL				
1.Exceedance for one sample	1. Inform IEC, ER, Contractor and EPD; 2. Identify source, investigate the causes of exceedance and propose remedial measures; 3. Repeat measurement to confirm finding; 4. Increase monitoring frequency to daily; 5. Assess effectiveness of Contractor remedial actions and keep IEC, EPD and ER informed of the results.	1. Check monitoring data submitted by ET; 2. Check Contractor's working method; 3. Discuss with ET and Contractor on possible remedial measures; 4. Advise the ER on the effectiveness of the proposed remedial measures; 5. Supervise implementation of remedial measures.	1. Confirm receipt of notification of failure in writing; 2. Notify Contractor; 3. Ensure remedial measures properly implemented.	1. Take immediate action to avoid further exceedance; 2. Discuss with ET and IEC on remedial actions 3. Submit proposals for remedial actions to IEC within 3 working days of notification; 4. Implement the agreed proposals; 5. Amend proposal if appropriate.

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

Appendix D1

Noise Monitoring Data

Monitoring Location :

NMS1N

Start Date & Time	Leq30min dB(A)*	L90 dB(A)	L10 dB(A)	Limit Level dB(A)
2021-03-03	59.8	48.5	61.5	75
2021-03-09	68.2	56.0	70.5	75
2021-03-15	60.5	42.5	62.5	75
2021-03-25	57.7	46.5	58.5	75
2021-03-29	61.0	43.0	63.5	75

Average :	63.2
Action Level :	When one valid documented complaint is received
Limit Level :	75.0 dB(A)
* Remark: For Free-field measurement, a correction of +3dB(A) should be made to the measured results.	

Monitoring Location :

NMS2N1

Start Date & Time	Leq30min dB(A)*	L90 dB(A)	L10 dB(A)	Limit Level dB(A)
2021-03-03	59.7	51.0	62.0	75
2021-03-09	58.2	51.5	59.5	75
2021-03-15	56.4	50.0	58.5	75
2021-03-25	60.1	52.5	62.5	75
2021-03-29	60.5	50.0	64.5	75

Average :	59.2
Action Level :	When one valid documented complaint is received
Limit Level :	75.0 dB(A)
* Remark: For Free-field measurement, a correction of +3dB(A) should be made to the measured results.	

Monitoring Location :

NMS3N

Start Date & Time	Leq30min dB(A)*	L90 dB(A)	L10 dB(A)	Limit Level dB(A)
2021-03-03	68.0	58.5	69.0	75
2021-03-09	57.5	54.0	59.0	75
2021-03-15	52.6	48.5	55.5	75
2021-03-25	60.1	52.5	62.5	75
2021-03-29	59.5	51.0	63.0	75

Average :	62.5
Action Level :	When one valid documented complaint is received
Limit Level :	75.0 dB(A)
* Remark: For Free-field measurement, a correction of +3dB(A) should be made to the measured results.	

Monitoring Location :

NMS4N

Start Date & Time	Leq30min dB(A)*	L90 dB(A)	L10 dB(A)	Limit Level dB(A)
2021-03-03	58.7	48.5	61.0	75
2021-03-09	53.2	42.5	54.0	75
2021-03-15	50.3	42.0	54.0	75
2021-03-25	54.3	43.0	55.0	75
2021-03-29	55.5	45.0	58.5	75

Average :	55.3
Action Level :	When one valid documented complaint is received
Limit Level :	75.0 dB(A)
* Remark: For Free-field measurement, a correction of +3dB(A) should be made to the measured results.	

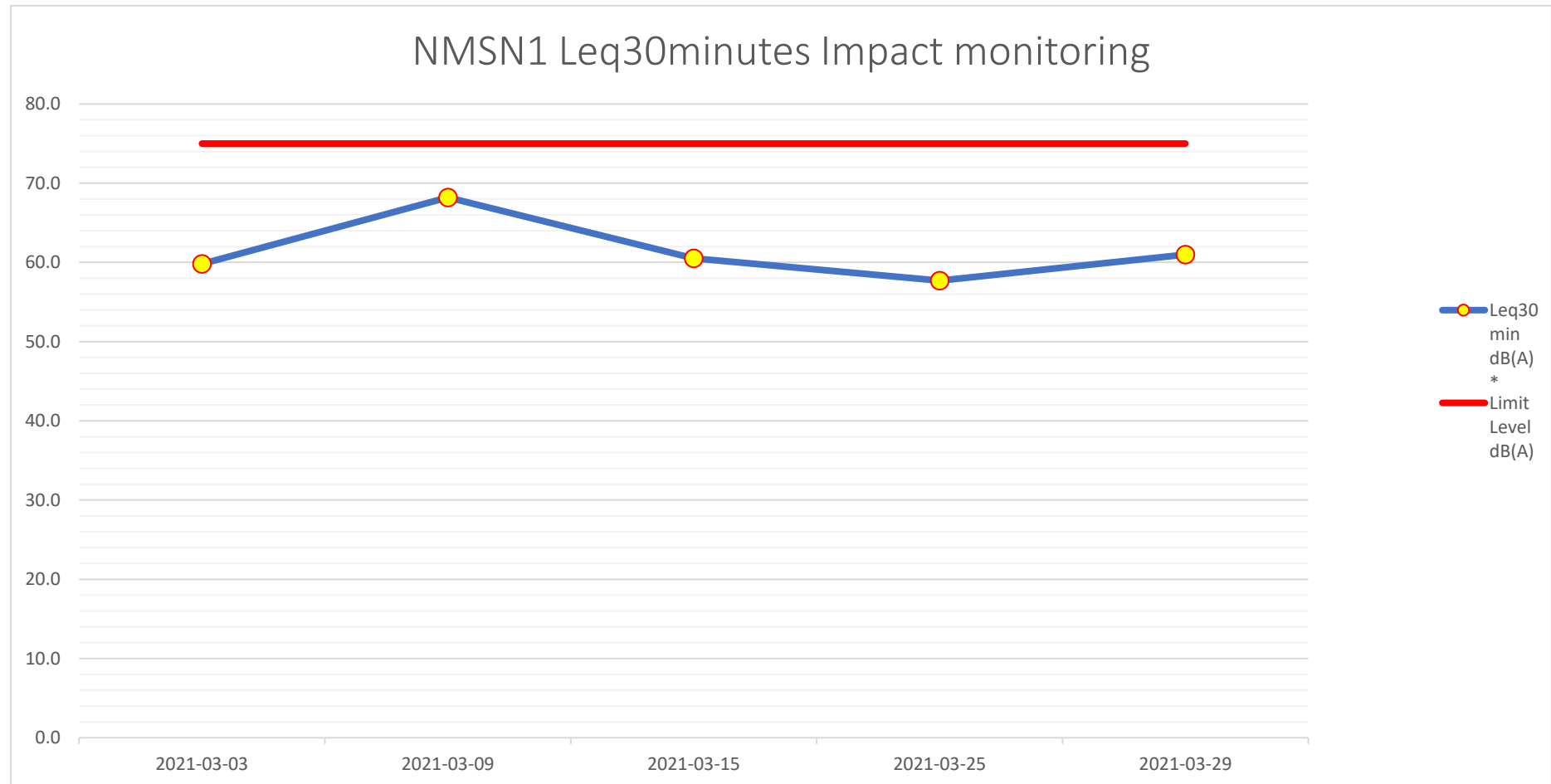
Appendix D2

Noise Monitoring result and Chart

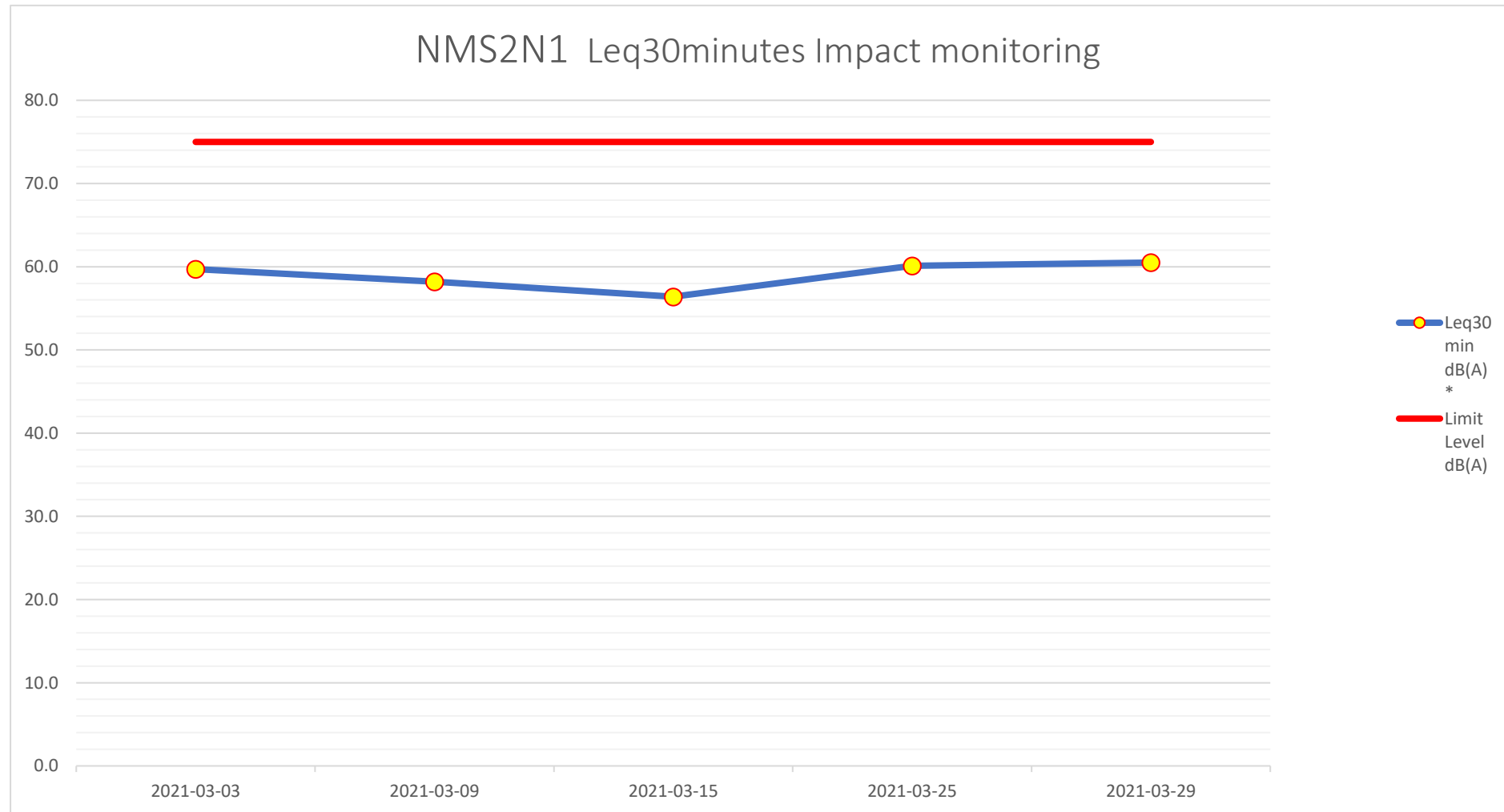
Appendix D2 - Nosie Monitoring Data Chart

Monitoring Station: NMS1N

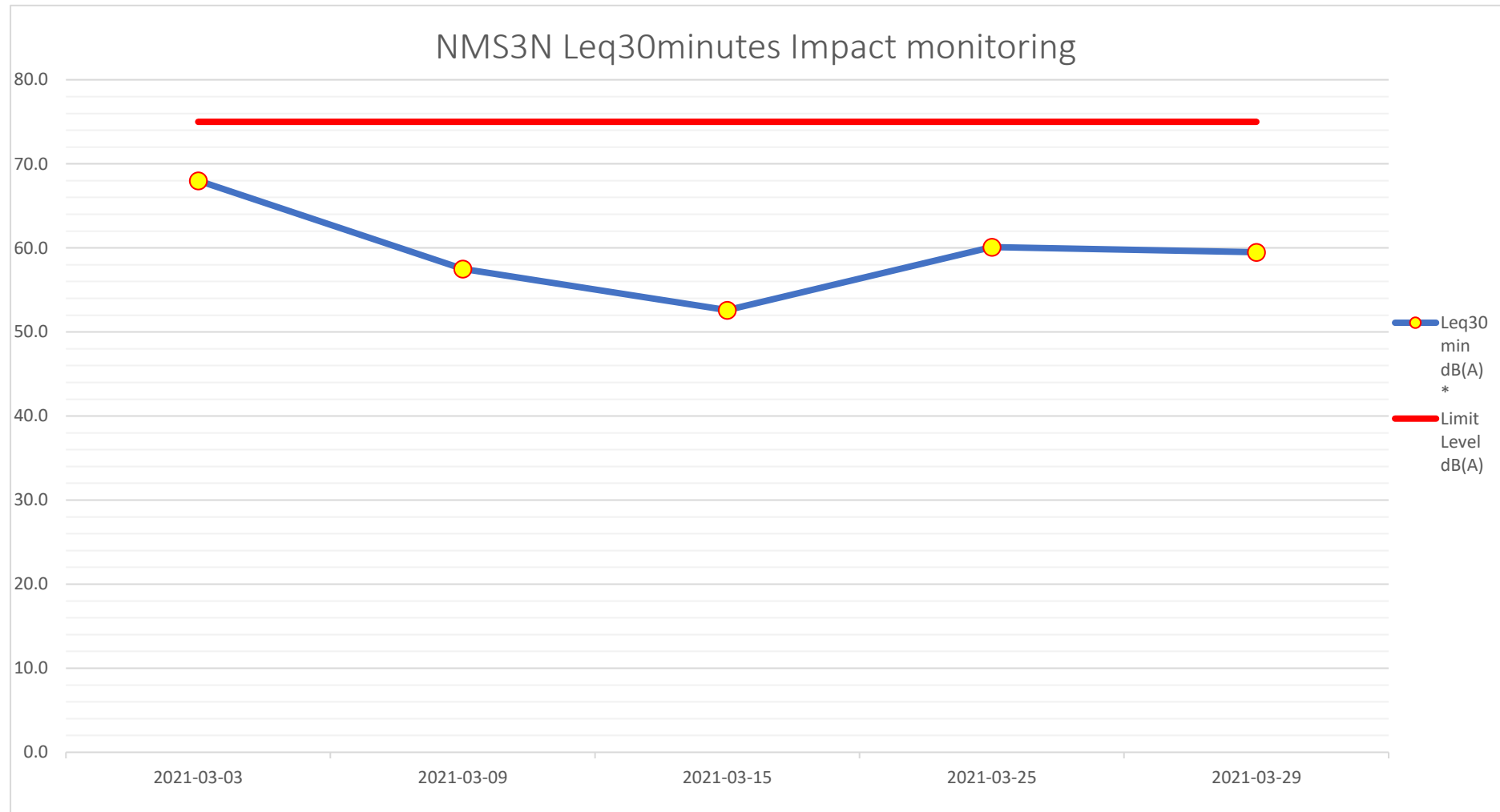
Leq30 minutes Impact Monitoring



Monitoring Station: NMS2N1
Leq30 minutes Impact Monitoring

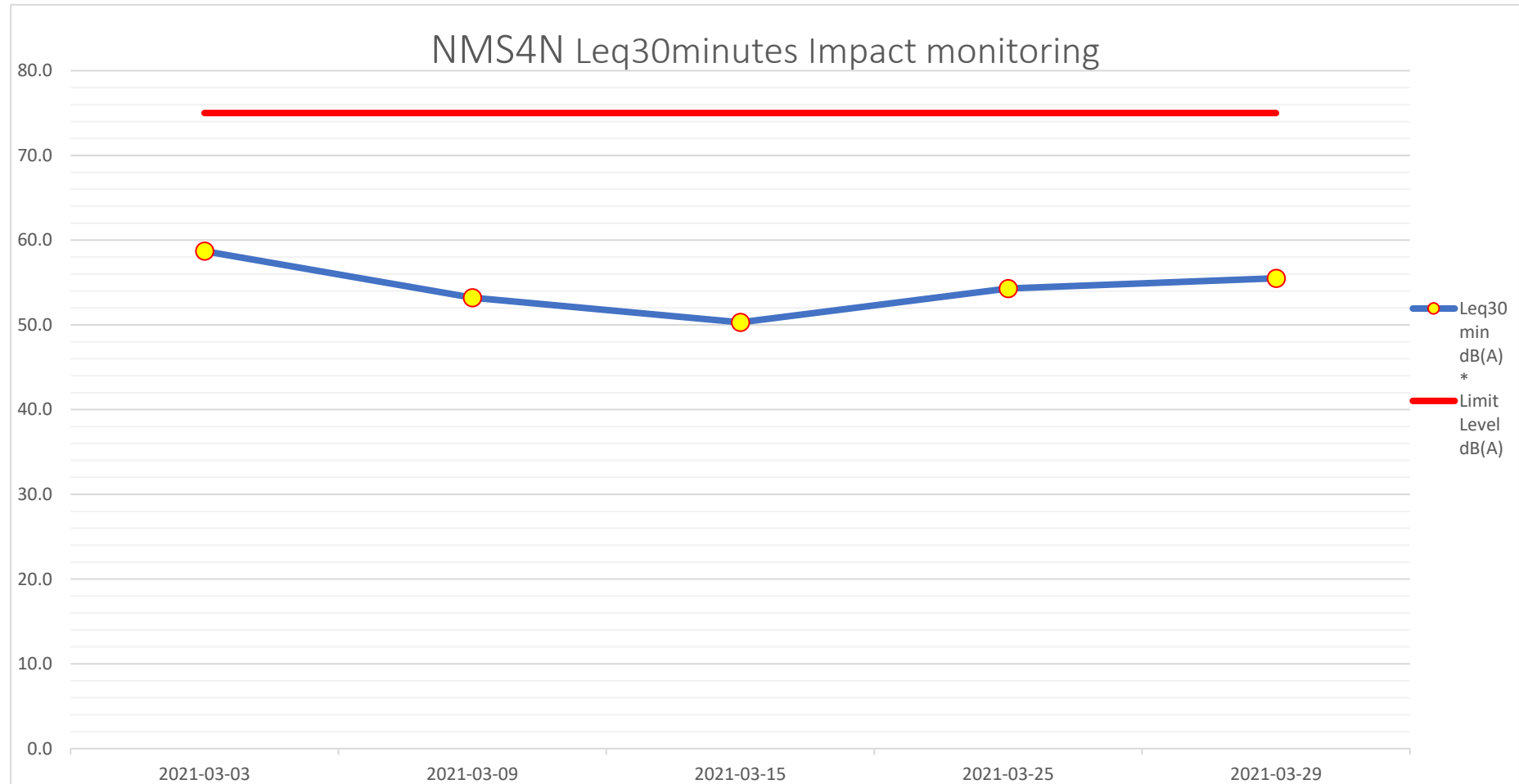


Monitoring Station: NMS3N
Leq30 minutes Impact Monitoring



Monitoring Station: NMS4N

Leq30 minutes Impact Monitoring



Appendix D3

Noise Monitoring Equipment Calibration Cert

Report no.: 203258CA202018

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CALIBRATION CERTIFICATE OF SOUND LEVEL METER

Client Supplied Information

Client : Fugro Technical Services Ltd.

Project : Calibration Services

Details of Unit Under Test, UUT

Description : Sound Level Meter

Manufacturer : Casella

Model No. :

CEL-63X

Microphone

CE-251

Preamplifier

CEL-495

Serial No. :

1488269

00995

003341

Equipment ID :

NA

Next Calibration Date :

28-Sep-2021

Specification Limit :

EN 61672-1: 2003 Class 1

Laboratory Information

Details of Reference Equipment -

Description : B & K Acoustic Multifunction Calibrator 4226 (Traditional free field setting)

Equipment ID. : R-108-1

Date of Calibration : 29-Sep-2020

Calibration Location : Calibration Laboratory of FTS

Ambient Temperature : 20±2 °C

Method Used : By direct comparison

Relative Humidity : <80% R.H.

Calibration Results :

Parameters		Mean Value (dB)	Specification Limit(dB)
A-weighting frequency response	4000Hz	0.9	2.6 to -0.6
	2000Hz	1.1	2.8 to -0.4
	1000Hz	0.0	1.1 to -1.1
	500Hz	-3.4	-1.8 to -4.6
	250Hz	-8.7	-7.2 to -10.0
	125Hz	-16.1	-14.6 to -17.6
	63Hz	-26.1	-24.7 to -27.7
	31.5Hz	-38.9	-37.4 to -41.4
Differential level linearity	94dB-104dB	0.0	± 0.6
	104dB-114dB	0.0	± 0.6

Remarks :

1. The equipment used in this calibration is traceable to recognized National Standards.
2. The mean value is the average of four measurements.
3. For calibration: Reference SPL are 94, 104 & 114dB, range setting is 20-140dB & time weighting is fast
4. The UUT does comply with EN 61672-1: 2003 Class 1 sound level meter for the above measurement.
5. The values given in this Calibration Certificate only relate to the values at the time of the test and any uncertainties will not include allowance for the equipment long term drift, variations with environment changes, vibration and shock during transportation, overloading, mis-handling or the capability of any other laboratory to repeat the measurement.

Checked by : William Date : 6-10-2020 Certified by : D. T. Young Date : 6-10-2020
CA-R-297 (22/07/2009) Leung Kwok Tai (Assistant Manager)

** End of Report **

Report no.: 203258CA202751

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CALIBRATION CERTIFICATE OF SOUND LEVEL METER

Client Supplied Information

Client : Fugro Technical Services Ltd.

Project : Calibration Services

Details of Unit Under Test, UUT

Description : Sound Level Meter

Manufacturer : Casella

Model No. :

Meter	Microphone	Preamplifier
CEL-63X	CE-251	CEL-495
1488271	01910	004065

Serial No. :

Equipment ID : N-52

Next Calibration Date : 21-Dec-2021

Specification Limit : EN 61672-1: 2003 Class 1

Laboratory Information

Details of Reference Equipment -

Description : B & K Acoustic Multifunction Calibrator 4226 (Traditional free field setting)

Equipment ID. : R-108-1

Date of Calibration : 22-Dec-2020

Calibration Location : Calibration Laboratory of FTS

Ambient Temperature : 20±2 °C

Method Used : By direct comparison

Relative Humidity : <80% R.H.

Calibration Results :

Parameters		Mean Value (dB)	Specification Limit(dB)
A-weighting frequency response	4000Hz	2.1	2.6 to -0.6
	2000Hz	1.4	2.8 to -0.4
	1000Hz	0.0	1.1 to -1.1
	500Hz	-3.5	-1.8 to -4.6
	250Hz	-8.8	-7.2 to -10.0
	125Hz	-16.3	-14.6 to -17.6
	63Hz	-26.3	-24.7 to -27.7
	31.5Hz	-39.2	-37.4 to -41.4
Differential level linearity	94dB-104dB	0.0	± 0.6
	104dB-114dB	0.0	± 0.6

Remarks :

1. The equipment used in this calibration is traceable to recognized National Standards.
2. The mean value is the average of four measurements.
3. For calibration: Reference SPL are 94, 104 & 114dB, range setting is 20-140dB & time weighting is fast.
4. The UUT does comply with EN 61672-1: 2003 Class 1 sound level meter for the above measurement.
5. The values given in this Calibration Certificate only relate to the values at the time of the test and any uncertainties will not include allowance for the equipment long term drift, variations with environment changes, vibration and shock during transportation, overloading, mis-handling or the capability of any other laboratory to repeat the measurement.

Checked by : William Date : 28-12-2020 Certified by : F. Leung Date : 28-12-2020
CA-R-297 (22/07/2009) Leung Kwok Tai (Assistant Manager)

**** End of Report ****

Report no.: 203258CA202083(1)

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CALIBRATION CERTIFICATE OF SOUND LEVEL METER

Client Supplied Information

Client : Fugro Technical Services Ltd.

Project : Calibration Services

Details of Unit Under Test, UUT

Description : Sound Level Meter

Manufacturer : Casella

Model No. :

CEL-63X

Serial No. :

1488300

Equipment ID :

N/A

Next Calibration Date :

04-Oct-2021

Specification Limit :

EN 61672-1: 2003 Class 1

Meter	Microphone	Preamplifier
CEL-63X	CE-251	CEL-495
1488300	03456	002850

Laboratory Information

Details of Reference Equipment -

Description : B & K Acoustic Multifunction Calibrator 4226 (Traditional free field setting)

Equipment ID. : R-108-1

Date of Calibration : 05-Oct-2020

Calibration Location : Calibration Laboratory of FTS

Ambient Temperature : 20±2 °C

Method Used : By direct comparison

Relative Humidity : <80% R.H.

Calibration Results :

Parameters	Mean Value (dB)	Specification Limit(dB)
A-weighting frequency response	4000Hz	0.8
	2000Hz	1.2
	1000Hz	0.0
	500Hz	-3.3
	250Hz	-8.7
	125Hz	-16.1
	63Hz	-26.2
	31.5Hz	-39.2
Differential level linearity	94dB-104dB	± 0.6
	104dB-114dB	± 0.6

Remarks :

1. The equipment used in this calibration is traceable to recognized National Standards.
2. The mean value is the average of four measurements.
3. For calibration: Reference SPL are 94, 104 & 114dB, range setting is 20-140dB & time weighting is fast.
4. The UUT does comply with EN 61672-1: 2003 Class 1 sound level meter for the above measurement.
5. The values given in this Calibration Certificate only relate to the values at the time of the test and any uncertainties will not include allowance for the equipment long term drift, variations with environment changes, vibration and shock during transportation, overloading, mis-handling or the capability of any other laboratory to repeat the measurement.

Checked by : William Date : 7-10-2020 Certified by : K. L. Leung Date : 8-10-2020
CA-R-297 (22/07/2009) Leung Kwok Tai (Assistant Manager)

** End of Report **

Report no.: 203258CA201566(2)

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CALIBRATION CERTIFICATE OF SOUND CALIBRATOR

Client : Fugro Technical Services Ltd.

Project : Calibration Services

Client Supplied Information**Details of Unit Under Test, UUT**

Description : Sound Calibrator
Manufacturer : Casella (Model CEL-120/1)
Serial No. : 4358251
Equipment ID : N/A
Next Calibration Date : 12-Aug-2021

Specification Limit : EN 60942: 2003 Class 1

Laboratory Information**Details of Calibration Equipment**

Description : Reference Sound level meter
Equipment ID. : R-119-1

Date of Calibration : 13-Aug-2020

Calibration Location : Calibration Laboratory of FTS Ambient Temperature : 20±2 °C

Method Used : By direct comparison

Calibration Results :

Parameters (Setting of UUT)	Mean Value (error of measurement)	Specification Limit(dB)
94dB	0.0 dB	±0.4dB
114dB	-0.2 dB	

Remarks :

1. The equipment used in this calibration is traceable to recognized National Standards.
2. The mean value is the average of four measurements.
3. The equipment does comply with the specification limit.
4. The values given in this Calibration Certificate only relate to the unit-under-test and the values measured at the time of the test. Any uncertainties quoted will not include allowances for the environmental changes, variation and shock during transportation, or the capability of any other laboratory to repeat the measurement.

Checked by : William Date : 18-8-2020 Certified by : K. T. Leung Date : 20-8-2020
CA-R-297 (22/07/2009) Leung Kwok Tai (Assistant Manager)

**** End of Report ****

Report no.: 203258CA201871(1)

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CALIBRATION CERTIFICATE OF SOUND CALIBRATOR

Client : Fugro Technical Services Ltd.

Project : Calibration Services

Client Supplied Information

Details of Unit Under Test, UUT

Description : Sound Calibrator
 Manufacturer : Casella (Model CEL-120/1)
 Serial No. : 5230736
 Equipment ID : N-18

Next Calibration Date : 07-Sep-2021

Specification Limit : EN 60942: 2003 Class 1

Laboratory Information

Details of Calibration Equipment

Description : Reference Sound level meter
 Equipment ID. : R-119-1

Calibration Date : 08-Sep-2020

Calibration Location : Calibration Laboratory of FTS Ambient Temperature : 20±2 °C

Method Used : By direct comparison Relative Humidity : <80% R.H.

Calibration Results :

Parameters (Setting of UUT)	Mean Value (error of measurement)	Specification Limit(dB)
94dB	0.1 dB	±0.4dB
114dB	0.2 dB	

Remarks :

1. The equipment used in this calibration is traceable to recognized National Standards.
2. The mean value is the average of four measurements.
3. The unit under test complies with the specification limit.
4. The values given in this Calibration Certificate only relate to the unit-under-test and the values measured at the time of the test. Any uncertainties quoted will not include allowances for the environmental changes, variation and shock during transportation, or the capability of any other laboratory to repeat the measurement.

Checked by : William Date : 10-9-2020 Certified by : K. T. Leung Date : 12-9-2020
 CA-R-297 (22/07/2009) Leung Kwok Tai (Assistant Manager)

**** End of Report ****

Report no.: 203258CA201298(3)

Page 1 of 1

CALIBRATION CERTIFICATE OF SOUND CALIBRATOR

Client Supplied Information

Client : Fugro Technical Services Ltd.

Project : Calibration Services

Details of Unit Under Test, UUT

Description : Sound Calibrator
Manufacturer : Casella (Model CEL-120/1)
Serial No. : 5230758
Equipment ID : N/A
Next Calibration Date : 13-Jul-2021
Specification Limit : EN 60942: 2003 Type 1

Laboratory Information

Description : Reference Sound level meter
Equipment ID. : R-119-1
Date of Calibration : 14-Jul-2020 Ambient Temperature : 20±2 °C
Calibration Location : Calibration Laboratory of FTS
Method Used : By direct comparison

Calibration Results :

Parameters (Setting of UUT)	Mean Value (error of measurement)	Specification Limit(dB)
94dB	-0.3 dB	±0.4dB
114dB	-0.3 dB	

Remarks :

1. The equipment used in this calibration is traceable to recognized National Standards.
2. The mean value is the average of four measurements.
3. The equipment does comply with the specification limit.
4. The values given in this Calibration Certificate only relate to the values at the time of the test and any uncertainties will not include allowance for the equipment long term drift, variations with environment changes, vibration and shock during transportation, overloading, mis-handling or the capability of any other laboratory to repeat the measurement.

Checked by : William Date : 21-7-2020 Certified by : Leung Kwok Tai Date : 21-7-2020
CA-R-297 (22/07/2009) Leung Kwok Tai (Assistant Manager)

** End of Report **

Report No. : 183057CA200894(4)

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CALIBRATION CERTIFICATE OF ANEMOMETER**Client Supplied Information**

Client : Fugro Technical Services Ltd.

Project : Calibration Services

Details of Unit Under Test, UUT

Description : Anemometer

Manufacturer : Benetech

Model No. : GM816

Serial No. : N/A

Equipment ID : WS-09

Next Calibration Date : 14-Jun-2021

Laboratory Information

Details of Reference Equipment –

Description : Reference Anemometer

Equipment ID : R-101-4

Date of Calibration : 15-Jun-2020 Ambient Temperature : 22 °C

Calibration Location : Calibration Laboratory of FTS

Method Used : R-C-279

Calibration Results :

Reference Reading (m/s)	UUT Reading (m/s)	Error (m/s)
1.93	2.0	0.1
4.00	4.0	0.0
6.10	6.0	-0.1
8.48	8.0	-0.5
10.81	10.0	-0.8

Remark :

1. The equipment being used in this calibration is traceable to recognized National Standards.
2. The reported readings in this calibration are an average from 10 trials.

Checked by : William Date : 20-6-2020 Certified by : L. T. Young Date : 20-6-2020
CA-R-297 (22/07/2009) Leung Kwok Tai (Assistant Manager)

**** End of Report ****

Appendix D4

Event and action Plan – Noise Monitoring

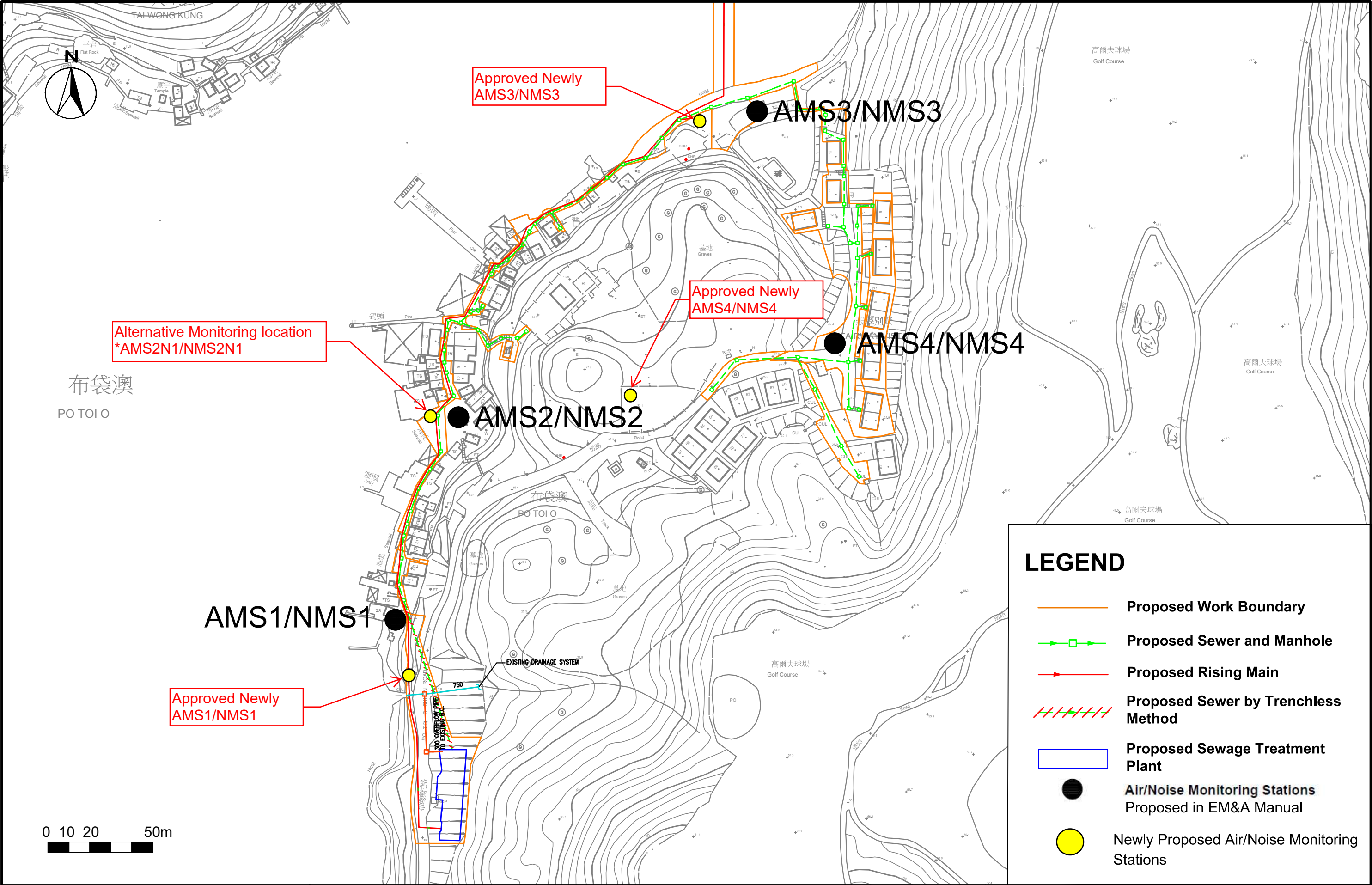
Appendix D4 - Event and Action Plan for Noise Impact



EVENT	ACTION			
	ET	IEC	ER	Contractor
Action Level	1. Notify IEC, ER and Contractor of exceedance; 2. Identify source 3. Investigate the causes of exceedance and propose remedial measures; 4. Report the results of investigation to the IEC, ER and Contractor; 5. Discuss with the IEC, ER and Contractor and formulate remedial measures; 6. Increase monitoring frequency to check mitigation effectiveness.	1. Review the analysed results submitted by the ET; 2. Review the proposed remedial measures by the Contractor and advise the ER accordingly; 3. Supervise the implementation of remedial measures.	1. Confirm receipt of notification of failure in writing; 2. Notify Contractor; 3. Require Contractor to propose remedial measures for the analysed noise problem; 4. Ensure remedial measures are properly implemented	1. Submit noise mitigation proposals to ER with copy to ET and IEC; 2. Implement noise mitigation proposals.

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

Appendix E1

Air quality and Noise quality Monitoring Location



 <div>香港特別行政區政府渠務署 THE GOVERNMENT OF THE HONG KONG SPECIAL ADMINISTRATIVE REGION DRAINAGE SERVICES DEPARTMENT</div>	 <div>CINOTECH Cinotech Consultants Limited</div>	Agreement No. CE 41/2013 (EP) Port Shelter Sewerage, Stage 3 – Sewerage Works at Po Toi O Environmental Impact Assessment Studies - Investigation			
		Location of Air and Noise Monitoring Stations			
		SCALE	AS SHOWN	DATE	MAR 15
		CHECK	MC	DRAWN	BC
		JOB No.	IA13070	FIGURE No.	3-1

Appendix E2

Air Quality and Noise Impact monitoring Schedule

Contract No. EP516/2016
Port Shelter Sewerage, stage 3 – Sewage Works at Po Toi O

2021/03 Air and Noise Quality Impact Monitoring Schedule

<i>Sunday</i>	<i>Monday</i>	<i>Tuesday</i>	<i>Wednesday</i>	<i>Thursday</i>	<i>Friday</i>	<i>Saturday</i>
28-Feb	1-Mar	2-Mar	3-Mar	4-Mar	5-Mar	6-Mar
			*Noise ** 1 - hr TSP **24- hr TSP			
7-Mar	8-Mar	9-Mar	10-Mar	11-Mar	12-Mar	13-Mar
		*Noise ** 1 - hr TSP **24- hr TSP				
14-Mar	15-Mar	16-Mar	17-Mar	18-Mar	19-Mar	20-Mar
	*Noise ** 1 - hr TSP **24- hr TSP				*Noise ** 1 - hr TSP **24- hr TSP	
21-Mar	22-Mar	23-Mar	24-Mar	25-Mar	26-Mar	27-Mar
				*Noise ** 1 - hr TSP **24- hr TSP		
28-Mar	29-Mar	30-Mar	31-Mar	1-Apr	2-Apr	3-Apr
	*Noise ** 1 - hr TSP **24- hr TSP					

* Noise Monitoring Locations: NSM1N,NMS2N,NMS3Nand NMS4N

** 1hr TSP and 24- hr TSP Monitoring Locations: ASM1N ,ASM2N1, ASN3N and ASM4N

Contract No. EP516/2016
Port Shelter Sewerage, stage 3 – Sewage Works at Po Toi O

2021/04 Air and Noise Quality Impact Monitoring Schedule

<i>Sunday</i>	<i>Monday</i>	<i>Tuesday</i>	<i>Wednesday</i>	<i>Thursday</i>	<i>Friday</i>	<i>Saturday</i>
28-Mar	29-Mar	30-Mar	31-Mar	1-Apr	2-Apr	3-Apr
				** 1 - hr TSP **24- hr TSP		
4-Apr	5-Apr	6-Apr	7-Apr	8-Apr	9-Apr	10-Apr
			*Noise ** 1 - hr TSP **24- hr TSP			
11-Apr	12-Apr	13-Apr	14-Apr	15-Apr	16-Apr	17-Apr
		*Noise ** 1 - hr TSP **24- hr TSP				
18-Apr	19-Apr	20-Apr	21-Apr	22-Apr	23-Apr	24-Apr
	*Noise ** 1 - hr TSP **24- hr TSP				** 1 - hr TSP **24- hr TSP	
25-Apr	26-Apr	27-Apr	28-Apr	29-Apr	30-Apr	1-May
				*Noise ** 1 - hr TSP **24- hr TSP		

* Noise Monitoring Locations: NSM1N,NMS2N,NMS3Nand NMS4N

** 1hr TSP and 24- hr TSP Monitoring Locations: ASM1N ,ASM2N1, ASN3N and ASM4N

Appendix E3

HKO Weather Data and On-site Wind- Speed Measurement

Daily Extract of Meteorological Observations, March 2021

Day	Hong Kong Observatory							King's Park	Waglan Island^	
	Mean Pressure (hPa)	Air Temperature			Mean Dew Point (deg. C)	Mean Relative Humidity (%)	Mean Amount of Cloud (%)	Total Rainfall (mm)	Total Bright Sunshine (hours)	Prevailing Wind Direction (degrees)
		Absolute Daily Max (deg. C)	Mean (deg. C)	Absolute Daily Min (deg. C)						
01	1016.2	25.0	21.9	20.0	18.5	81	78	Trace	5.1	***
02	1018.4	25.6	21.4	19.1	16.4	75	59	Trace	8.7	***
03	1020.1	19.1	18.4	17.8	15.0	81	88	0.3	0.3	***
04	1018.0	19.4	18.9	18.3	16.7	87	93	1.0	0.0	***
05	1015.9	21.1	20.1	19.2	18.6	91	88	Trace	0.1	***
06	1016.3	21.7	20.5	19.6	19.4	93	93	1.5	0.1	***
07	1018.8	20.5	19.9	19.1	18.2	90	88	0.2	0.0	***
08	1020.1	22.6	19.7	18.3	16.6	83	83	0.3	3.6	***
09	1019.9	22.9	20.1	18.6	16.3	79	55	0.0	4.0	***
10	1020.0	21.7	19.8	19.2	16.2	79	87	Trace	1.2	***
11	1019.8	24.2	21.0	18.8	17.2	79	64	0.0	7.1	***
12	1018.4	27.7	23.2	20.2	18.9	77	32	0.0	10.3	***
13	1018.6	24.7	22.0	20.5	17.5	76	57	Trace	6.3	***
14	1016.6	23.6	21.3	20.1	17.6	80	76	0.0	3.9	***
15	1014.8	26.3	22.4	19.9	17.8	76	46	0.0	9.9	***

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16	1013.3	28.8	24.0	21.1	19.8	78	22	0.0	10.2	***
17	1012.9	28.8	24.7	21.8	20.9	80	42	Trace	10.7	***
18	1013.2	26.2	23.4	22.2	21.0	87	81	0.2	3.6	***
19	1012.3	27.7	24.2	22.8	20.9	82	55	Trace	9.0	***
20	1010.7	29.7	25.0	22.3	21.3	81	32	0.0	10.6	***
21	1015.8	24.2	21.2	17.2	16.0	73	80	0.0	0.0	***
22	1022.8	20.9	17.8	15.8	10.3	61	87	Trace	1.9	***
23	1020.6	20.0	18.9	17.9	11.1	61	88	0.0	0.1	***
24	1016.5	23.5	20.7	18.4	14.6	68	86	0.0	3.8	***
25	1016.5	25.2	22.1	20.7	16.2	70	45	0.0	9.0	***
26	1015.4	25.2	21.6	19.5	16.9	75	65	0.0	6.9	***
27	1012.0	28.6	24.1	21.8	20.3	80	62	0.0	7.0	***
28	1009.6	28.1	24.8	22.6	21.0	80	46	0.0	8.0	***
29	1007.3	28.5	25.6	23.6	22.2	82	81	0.0	5.8	***
30	1006.2	29.0	26.6	25.3	22.4	78	81	0.0	3.8	***
31	1006.6	29.0	26.5	25.3	22.5	79	86	0.0	2.4	***
Mean/Total	1015.6	24.8	22.0	20.2	18.0	79	69	3.5	153.4	***

*** unavailable

^ Information of wind direction and wind speed for Waglan Island are based on automatic weather station data since January 1989

Trace means rainfall less than 0.05 mm

Source: <https://www.hko.gov.hk/en/cis/dailyExtract.htm?y=2021&m=3>

Wind Speed Data during Monthly Impact monitoring

Date	^ AMSN1/NMS1 Mean Wind Speed (m/s)	^AMSN2N1/NMS2N1 Mean Wind Speed (m/s)	^AMS3N/NMS3N Mean Wind Speed (m/s)	^AMS4N/NMS4N Mean Wind Speed (m/s)
2021/03/03	0.4	0.2	0.3	0.6
2021/03/09	0.2	0.3	0.4	0.3
2021/03/15	0.2	0.4	0.2	0.1
2021/03/19	0.2	0.3	0.2	0.4
2021/03/25	0.4	0.5	0.5	0.7
2021/03/29	0.9	0.6	0.7	0.4

^ Wind speed data were determined by the on-site wind speed measurement with portable wind speed meter.

Appendix F

Monthly summary of waste flow table

Appendix F

MONTHLY SUMMARY WASTE FLOW TABLE

Name of Department: DSD
Contract No. DC 2019/09 Port Shelter Phase 3, Po Toi O Sewage Treatment Plant

Monthly Summary Waste Flow Table for 2021 (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 notes 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 '000kg)	(in '000kg)	(in '000kg)	(in '000kg)	(in '000m ³)
Jan											
Feb											
Mar	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Apr											
May											
June											
Sub-Total	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
July											
Aug											
Sep											
Oct											
Nov											
Dec											
Total	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

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 of as Public Fill	Imported Fill	Metals	Paper/ cardboard packaging	Plastics (see notes 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 '000kg)	(in '000kg)	(in '000kg)	(in '000kg)	(in '000m ³)
0	0	0	0	0	0	0	0	0	0	0

- Notes:
- (1) The performance targets are given in the Environmental Management Plan.
 - (2) The waste flow table shall also include C&D materials to be imported for use at the Site.
 - (3) Plastics refer to plastic bottles/containers, plastic sheets/foam from packaging material.
 - *(4) The *Contractor* shall also submit the latest forecast of the total amount of C&D materials expected to be generated from the *works*, together with a breakdown of the nature where the amount of C&D materials expected to be generated from the *works* is equal to or exceeding 50,000 m³. [*Delete Noted (4) and the table above on the forecast, where inapplicable*].

Appendix G

Monthly Summary of Environmental findings and remedial actions during Weekly Site Inspection

Appendix G - Monthly Summary of Environmental findings and remedial actions during Weekly Site Inspection

Reporting Month: 2021/03

Commencement Works Area: PTO_SW_01

Inspection Date	Key Observations / Reminders	Recommendations/ Actions	Close- Out Date
2021/03/04	No Construction Works observed in the commencement works area (PTO_SW_01)	N/A	N/A
2021/03/04	Reminder	The contractor was reminded to review the design works program and method statement to minimize the work area.	2021/03/04
2021/03/04	Reminder	The contractor was reminded well prepare for the temporary materials storage.	2021/03/04
2021/03/11	No Construction Works observed in the commencement works area (PTO_SW_01)	N/A	N/A
2021/03/11	Reminder	The contractor was reminded to review the design for the temporary drainage system in PTO_SW_01 Work's area.	2021/03/11
2021/03/11	Reminder	The contractor was reminded make sure provide buffer zone form the site boundary to LF 04 and LF 05.	2021/03/11
2021/03/18	No Construction Works observed in the commencement works area (PTO_SW_01)	N/A	N/A

2021/03/18	Reminder	The contractor was reminded well prepare for the drainage system of PTO_SW_01 Works area.	2021/03/18
2021/03/26	No Construction Works observed in the commencement works area (PTO_SW_01)	N/A	N/A
2021/03/26	Reminder	The contractor was reminded to prevent rainwater entering trenches and excavation pit.	2021/03/26

Remark:

No Construction Works observed in the commencement works area (PTO_SW_01) in this reporting month.

Appendix H

Recommended Mitigation Measures and Proactive Environmental Protection Proforma

Appendix H Recommended Mitigation Measures and Proactive Environmental Protection Proforma

Reporting Period: 2021-03-01 – 2021-03-31

Construction Works Area: PTO-SW-01

Anticipated Impacts: Dust, Noise, Water Quality, Terrestrial Ecology, Marine Ecology, Fisheries, Waste Management, Landscape and Visual and Build Heritage Impact.

Item	EIA Ref.	EM&A Ref.	Environmental Aspect	Corresponding Mitigation Measures	EM&A Manual Recommended Mitigation/ Actions	Action By	Measurement Procedures/Methods
Air Quality Impact	3.8	A10 - A25	a) Major air quality impact in construction phase would arise from excavation of slope at the proposed sewage treatment plant. b) Excavation, Gas welding, slope cutting, Rock dower, fencing, flexible barrier installation Loading & Unloading Dusty Materials storage, Dusty Waste Sorting, Temporary Site Traffic Control	a) All construction plants / machineries will be checked / serviced on a regular basis during the courses of construction to minimize the emission of noise generation and eliminate dark smoke emission b) All dump trucks will be equipped with mechanical covers to prevent the dust emission during transportation when necessary. c) Dust control measures, such as water spraying, will be provided during demolition works when necessary. d) Maintaining of wet surface on access road and keep slow speed in the site. e) Conditions in the Environmental Permit and Discharge License should be followed	(a) Hoarding of not less than 2.4 m high shall be erected from ground level to surround the work area along Po Toi O Chuen Road except for a site entrance or exit. (b) Good housekeeping to minimize dust generation, e.g. by properly handling and storing dusty materials. (c) Adopt dust control measures, such as dust suppression using water spray on exposed soil at least 4 times a day, in areas with dusty construction activities and during material handling. (d) Minimize exposed earth after completion of work in a certain area by hydroseeding, vegetating, soil compacting or covering with bitumen.	Contractor	a) 1-hour and 24-hour TSP levels will be measured in accordance to the standard high-volume sampling method as set out in the Title 40 of the Code of Federal Regulations, Chapter 1 (Part 50), Appendix A. b) Due to objection from the residents of Po Toi O village of the use of high-volume sampler (HVS) in conducting 24-hours TSP measurement, 24-hour TSP measures for impact monitoring is to be measured by portable dust meters during construction phase of the project. This is to be approved and verified by ER and IEC. c) Other than using high volume sampler, 1-hour TSP levels can be measured alternatively by direct reading from portable dust meters upon approval

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Item	EIA Ref.	EM&A Ref.	Environmental Aspect	Corresponding Mitigation Measures	EM&A Manual Recommended Mitigation/ Actions	Action By	Measurement Procedures/Methods
				<p>f) Predict required quantity of concrete accurately and collect the unused fresh concrete at designated locations in the site for subsequent disposal.</p> <p>g) Provide sufficient mitigation measures as recommended in approved EIA Manual requirement.</p>	<p>(e) Provide wheel washing at site exit to prevent carrying dust outside of the site.</p> <p>(f) Cover materials on trucks before leaving the site.</p> <p>(g) Limit vehicle speed of construction trucks within the construction site and in Po Toi O, maximum at 10km/hr, and confine vehicle movement in haul road.</p> <p>(h) As there is limited space in Po Toi O, stockpiling should be avoided. However, if found necessary, the materials should be covered by impervious materials such as tarpaulin.</p>		<p>from ER. The meters should be capable of producing comparable results as that by the high-volume sampling method, to indicate short event impacts.</p> <p>d) -The ET shall agree with the IEC on the monitoring position and the corrections adopted.</p> <p>e) -The agreed position shall be chosen in subsequent baseline and impact monitoring.</p>

Item	EIA Ref.	EM&A Ref.	Environmental Aspect	Corresponding Mitigation Measures	EM&A Manual Recommended Mitigation/ Actions	Action By	Measurement Procedures/Methods
Noise Impact Control	4.7	N1 - N17	<p>a) The Project comprises three main works including the construction of sewage treatment plant (STP), underground sewers and rising main, and the submarine outfall</p> <p>b) The major noise impact will arise from the use of powered mechanical equipment.</p> <p>c) Excavation, Gas welding, slope cutting, Rock dowel, fencing, flexible barrier installation Loading & Unloading Dusty Materials storage, Temporary Site Traffic Control</p>	<p>a) Conditions in the Environmental Permit and Discharge License should be followed</p> <p>b) Provide sufficient mitigation measures as recommended in approved EIA Manual requirement.</p>		Contractor	<p>a) Noise measurement shall normally be at a point 1 m from the exterior of the sensitive receiver building façade and be at a position 1.2 m above the ground. If the normal monitoring position cannot be accessed, an alternative position may be chosen, and a correction to the measurements shall be made. For reference, a correction of +3 dB(A) shall be made to the free field measurements.</p> <p>b) The ET shall agree with the IEC on the monitoring position and the corrections adopted.</p> <p>c) The agreed position shall be chosen in subsequent baseline and impact monitoring.</p>

Item	EIA Ref.	EM&A Ref.	Environmental Aspect	Corresponding Mitigation Measures	EM&A Manual Recommended Mitigation/ Actions	Action By	Measurement Procedures/Methods
Water Quality impact	5.8	W1 - W33	a) Major Water quality impact will be originated from minor displacement of suspended solids during installation, testing pipe and extraction of cofferdam around the proposed diffuser.	a) Wastewater to be treated by wastewater treatment facilities before discharge b) Conditions in the Environmental Permit and Discharge License should be followed	(a) Well manage construction materials, chemicals, sewage for proper storage and usage and to prevent accumulation onsite. (b) Immediately clean up contaminated soil upon chemical and oil leakage. (c) Label chemical waste containers according to the Code of Practice to notify and warn the waste handlers. Store fuels, chemicals and chemical waste at designated area with locks and bunds. (d) Register as chemical waste producer. (e) Set up sedimentation tank for settling suspended solids in wastewater before discharge into storm drains. Sand/silt removal facilities such as sand traps, silt traps and sedimentation basin should be provided with adequate capacity. (f) Provide sufficient number of chemical toilets if necessary and employ licensed contractor for regular clean-up and maintenance.	Contractor	a) Weekly site audit to monitor the implementation of the proposed water quality mitigation measures and check the Contractor's work practice on water pollution prevention during construction phase. b) Should water pollution is observed (e.g. discharge of silty water into storm drains), the ET should record the environmental deficiency for investigation. c) The Contractor should be notified and responsible for carrying out rectification work immediately. d) The ET shall re-inspect the Project Site and review the effectiveness of the remedial measure performed until satisfaction. e) The Contractor shall implement preventive measure to avoid causing the same problem.

Item	EIA Ref.	EM&A Ref.	Environmental Aspect	Corresponding Mitigation Measures	EM&A Manual Recommended Mitigation/ Actions	Action By	Measurement Procedures/Methods
					<p>(g) Provide wheel washing at site exit to prevent dust and silty water from leaving the construction site.</p> <p>(h) Cover slope and loose materials with tarpaulin before rainstorm and inspect the area afterwards.</p> <p>(i) Cover manhole to prevent silt, construction materials or debris and surface runoff from entering the foul sewer.</p> <p>(j) Install fully enclosed cofferdam around the proposed diffuser and deploy a dredger barge outside the cofferdam for dredging and filling works.</p>		

Item	EIA Ref.	EM&A Ref.	Environmental Aspect	Corresponding Mitigation Measures	EM&A Manual Recommended Mitigation/ Actions	Action By	Measurement Procedures/Methods
Terrestrial Ecology	6.12	E1-E8	<p>a) The proposed Project will cause minor habitat loss of shrubland, temporary habitat loss of woodland, developed area and rocky shore, and removal of one individual climber species of conservation importance that is common within the Study Area and Hong Kong. Indirect water quality impact may arise from surface runoff or accidental spillage of chemicals in construction phase.</p> <p>b) Use of powered plant equipment may bring noise disturbance on wildlife.</p>	<p>a) Conditions in the Environmental Permit and Discharge License should be followed</p> <p>b) Provide sufficient mitigation measures as recommended in approved EIA Manual requirement.</p>	<p>a) Construction noise and water quality mitigation measures proposed in the previous sections will be applicable to terrestrial ecology.</p>	Contractor	<p>(a) Bright colour fencing shall be erected along the boundary of the undisturbed region of the shrubland and woodland, and around <i>Diospyros vaccinioides</i>, a plant species of conservation importance, near the work boundary to remind workers not to trespass or occupy the area, and to be careful during operation of equipment.</p> <p>(b) Inspect the condition of <i>Diospyros vaccinioides</i> as part of weekly site audit.</p> <p>(c) Reinstatement of the disturbed rocky shore with the rocks temporarily removed.</p> <p>(d) Carry out compensatory tree planting in accordance with DEVB TCW No. 7/2015 to reinstate the affected woodland.</p>

Item	EIA Ref.	EM&A Ref.	Environmental Aspect	Corresponding Mitigation Measures	EM&A Manual Recommended Mitigation/ Actions	Action By	Measurement Procedures/Methods
Marine Ecology	7	7	<p>a) The proposed Project will cause minor habitat loss of muddy seabed.</p> <p>b) Indirect water quality impact may arise from installation and extraction of sheet pile of cofferdam in construction phase.</p> <p>c) Dredging and backfilling for installation of diffuser will be conducted inside fully enclosed cofferdam. No marine sediment loss to water column is expected.</p>	a) Conditions in the Environmental Permit and Discharge License should be followed	a) The variation in water quality at coral and amphioxus habitats during cofferdam installation and extraction works will be overseen by water quality monitoring mentioned.	Contractor	a) No specific monitoring and audit programme is required. With proper implementation of water quality mitigation measures, residual impact is expected to be acceptable.

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Item	EIA Ref.	EM&A Ref.	Environmental Aspect	Corresponding Mitigation Measures	EM&A Manual Recommended Mitigation/ Actions	Action By	Measurement Procedures/Methods
Fisheries	8	8	<p>a) No direct encroachment on Fish Culture Zone and Artificial Reefs in the Study Area is expected.</p> <p>b) About 1,920 m² of fishing ground and 500 m² of benthic spawning ground will be affected. Except the 5 m² benthic spawning ground will be lost permanently, other impacted area will only be affected in construction phase temporarily (reversible impact). Indirect impact on fisheries resources by the water quality deterioration will be insignificant with proper implementation of water quality mitigation measures.</p>	a) Conditions in the Environmental Permit and Discharge License should be followed	Water quality at FCZ will be monitored during cofferdam installation and extraction works and dredging works in the construction phase as proposed.	Contractor	a) No specific monitoring and audit programme are required. With proper implementation of water quality mitigation measures, residual impact is anticipated to be acceptable.

Item	EIA Ref.	EM&A Ref.	Environmental Aspect	Corresponding Mitigation Measures	EM&A Manual Recommended Mitigation/ Actions	Action By	Measurement Procedures/Methods
Waste Management	9.8	WM4-WM23	<p>a) Construction of the sewage treatment plant, laying of gravity sewers and rising mains and submarine outfall are expected to generate mainly inert construction and demolition (C&D) materials (or public fill) from excavation, and unused building materials. Other wastes include non-inert C&D materials (or C&D waste), plant materials, scaffolding, formwork and packaging, chemical waste from plant maintenance, bentonite slurry from drilling works and general refuse from workers.</p> <p>b) Dredging at the proposed diffuser location will generate marine sediment.</p>	<p>a) All C&D materials generated will be transported and stored at temporary storage area. Cover will be provided during transportation of dusty materials. Suitable materials will be sorted for reuse on-site. Only non-inert C&D material will be disposed off-site to NENT Landfill.</p> <p>b) Conditions in the Environmental Permit and Discharge License should be followed</p>	<p>(a) Reuse C&D materials onsite and dispose excess uncontaminated ones to public fill.</p> <p>(b) Provide sufficient waste collection points for general refuse and regularly maintained to avoid accumulation. Dispose the waste at waste transfer or disposal facilities.</p> <p>(c) Minimize wastage through careful planning and avoiding over-purchase of construction materials.</p> <p>(d) Provide training to workers on site cleanliness, waste management (waste reduction, reuse and recycle) and chemical handling procedures.</p> <p>(e) Hire licensed waste disposal contractors for waste collection and removal. Dispose waste at licensed waste disposal facilities.</p> <p>(f) Recondition and reuse bentonite as far as practical.</p> <p>(g) Conduct marine sediment test and dump dredged marine sediment according to <i>ETWB TCW No. 34/2002 Management of</i></p>	Contractor	<p>The Contractor should apply for relevant licences/permits for waste disposal under different regulations and ordinances as follows:</p> <p>(a) Chemical Waste Permits/licenses under the Waste Disposal Ordinance (Cap 354);</p> <p>(b) Public Dumping Licence under the Land (Miscellaneous Provisions) Ordinance (Cap 28);</p> <p>(c) Marine Dumping Permit under Dumping at Sea Ordinance (Cap 466); and</p> <p>(d) Effluent Discharge Licence under the Water Pollution Control Ordinance (Cap 358).</p> <p>b) Reference should be made to EPD's booklets on licences/permits. The Contractor shall also document recycling receipts/ disposal record to keep track of waste movement. The ET shall check with the Contractor that these licences/permits have been obtained. He should also review the above documentations regularly to ensure compliance with legislations and specifications.</p>

Item	EIA Ref.	EM&A Ref.	Environmental Aspect	Corresponding Mitigation Measures	EM&A Manual Recommended Mitigation/ Actions	Action By	Measurement Procedures/Methods
				<p>c) Fueling of equipment will be conducted carefully on-site by mobile tanker to avoid storage of fuel and oil spillage.</p> <p>d) Provision of drip trays for equipment likely cause spillage of chemical / fuel, and provide routine maintenance.</p>	<p><i>Dredged/Excavated Sediment</i> and Dumping at Sea Ordinance.</p> <p>(h) Chemical waste shall be handled, stored and disposed properly, according to the relevant guidelines.</p>		

Item	EIA Ref.	EM&A Ref.	Environmental Aspect	Corresponding Mitigation Measures	EM&A Manual Recommended Mitigation/ Actions	Action By	Measurement Procedures/Methods
Landscape and Visual impact	Table 10-6 & 10-7	CM1-CM8 & OM1-OM5	a) Minor landscape and visual impact is expected due to dredging work in open sea, construction of the STP and pipelines on land and the loss of existing trees and vegetation at the sewage treatment plant site in the construction phase.	a) Conditions in the Environmental Permit and Discharge License should be followed b) Implement the recommended mitigation proposed in EM&A manual	a) The contractor shall employ a professionally qualified Registered Landscape Architect (RLA) on the Environmental Team to supervise and monitor the implementation of construction phase landscape and visual mitigation measures. This is necessary to ensure that all the recommended landscape and visual mitigation measures under Chapter 10 of the EIA are effectively implemented including minimization of the works footprint, ensuring that those existing trees earmarked for retention on site or transplanting are protected and planting works are correctly implemented.	Contractor	a) Tree risk assessment shall be undertaken by the contractor during construction to all existing trees within the project site as per "Guidelines for Tree Risk Assessment and Management Arrangement". b) Site inspections by appointed RLA shall be undertaken at monthly intervals to closely monitor all these aspects of work. Inspection findings shall be logged in a site monitoring report with any discrepancies or concerns regarding the implementation and effectiveness of mitigation measures highlighted.

Item	EIA Ref.	EM&A Ref.	Environmental Aspect	Corresponding Mitigation Measures	EM&A Manual Recommended Mitigation/ Actions	Action By	Measurement Procedures/Methods
Build Heritage	11.6	BH1 - BH5	a) As the proposed work is close to some of the identified built heritage resources, condition survey, vibration and settlement monitoring are recommended to identified built heritage to prevent indirect damage by mechanical vibration and settlement.	a) Conditions in the Environmental Permit and Discharge License should be followed b) Provide sufficient mitigation measures as recommended in approved EIA Manual requirement.	a) Provision of protective covering or protective screen is recommended to identified built heritage to prevent damages by construction tools or waste. b) Maintenance of public access is suggested for identified built heritage. Besides, buffer zone of at least 1m from the works boundary should be provided for identified built heritage as far as possible. c) Condition survey, vibration and settlement monitoring to identified built heritage.	Contractor	a) A maximum vibration level of 7.5mm/s shall be adopted for the Grade 3 Hung Shing Temple and settlement check points in the Alert/Alarm/Action limit levels at 6mm/8mm/10mm shall be adopted.

Appendix I

Cumulative Statistics on Complaints, Notifications of Summons

Appendix I Cumulative Statistics on Complaints, Notifications of Summons, Successful Prosecutions and Public Engagement Activities

Environmental Complaints Log

Complaint Log No.	Date of Complaint	Received From	Received By	Nature of Environmental Complaint	Relevant to the Construction Work of Project Site? (Y/N)	Investigation/ Mitigation Action	Status
-	-	-	-	-	-	-	-

Remark:

** No Complaints, Notifications of Summons or Successful Prosecutions was received in the reporting period.*

Cumulative Statistics on Complaints, Notifications of Summons and Successful Prosecutions and Public Engagement Activities

Reporting Period	Complaints	Notifications of Summons and Prosecutions	Public Engagement Activities
This Month	0	0	0
Cumulative Project-to-Date	0	0	0