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**Your Reference**

**Contract No. CM 04/2021**

**Our Reference**  
AFK/EC/TC/LL/kl/  
T601424122/L045

**Independent Environmental Checker for Environmental Monitoring Works for  
Upgrading of Cheung Chau Sewage Treatment and Disposal Facilities**

**Environmental Permit No. EP-488/2014/A**

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**Monthly EM&A Report for December 2022 (Rev. 1)**

12 January 2023

**By Email**

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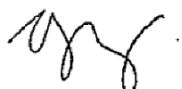
Dear Sir,

I refer to the Monthly EM&A Report for December 2022 (Rev. 1) under the captioned Project, which was certified on 12 January 2023 by the Environmental Team Leader appointed under Condition 2.1 of Environmental Permit No. EP-488/2014/A (hereafter referred to as “EP”).

I hereby verify the abovementioned submission in accordance with EP Conditions 1.9 and 4.4.

Should you have any queries regarding the captioned or require any further information, please contact the undersigned at 2828 5751.

Yours faithfully  
for MOTT MACDONALD HONG KONG LIMITED



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**Drainage Services Department**  
The Government of the Hong Kong Special Administrative Region




**Contract No. DC/2019/07**

**Environmental Monitoring Works for  
Upgrading of Cheung Chau Sewage Collection, Treatment and  
Disposal Facilities**

**17th Monthly Environmental Monitoring and Audit Report –  
December 2022**

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Position	Environmental Team Member	Environmental Team Member	Environmental Team Leader
Signature			
Date:	11/01/2023	12/01/2023	12/01/2023

## REVISION HISTORY

<b>REV.</b>	<b>DESCRIPTION OF MODIFICATION</b>	<b>DATE</b>
0	First Issue for Comments	11 January 2023
1	Updated the report according to IEC's comment	12 January 2023

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## EXECUTIVE SUMMARY

- A.1 Pursuant to the Environmental Impact Assessment Ordinance (EIAO), the Director of Environmental Protection (DEP) granted the Environmental Permit (No. EP-488/2014/A) to DSD for the Project.
- A.2 Upon the requirement of the Environmental Permit (EP), the Monthly EM&A Monitoring Report shall be submitted to the DEP within 10 working days after the end of the reporting month. The submissions shall be verified by the Independent Environmental Checker (IEC) and complied with the requirements set out in the Environmental Monitoring and Audit (EM&A) Manual before submission to the DEP as stipulated in Condition 4.4 of the EP.
- A.3 The commencement date of the Project was 6 August 2021. Impact environmental monitoring of 24-hour TSP, 1-hour TSP and noise was conducted as stipulated in Condition 4.2 of the EP. This is the 17<sup>th</sup> Monthly EM&A Report for the Project summarizing the monitoring results and audit findings of the EM&A programme at selected locations at and around Cheung Chau during the reporting period from 1 December to 31 December 2022.
- A.4 Key activities carried out in this reporting period for the Project included the followings:
- Trial pit and ground investigation
  - Smart sewage monitoring
  - Pre-bored Works for Sheet Piles Installation for Subsequent ELS at CCSTW
  - Repair Works for Existing Sludge Ramp
  - Excavation and Lateral Support (ELS) at CCSTW
  - Mechanical Installation Works of Pak She Sewage Pumping Station
  - Construction of Superstructure of LV Main Switch Room and Transformer Room at CCSTW
  - Construction of Sludge Digester Building
- A.5 The major environmental impacts brought by the above construction works include:
- Construction dust and noise generation from construction works and piling works
  - Wastewater generated from construction activities
  - Waste generation from the construction activities
- A.6 The key environmental mitigation measures implemented for the Project in this reporting period associated with the above construction works include:
- Dust suppression by regular wetting and water spraying for construction works
  - Reduction of noise from equipment and machinery on-site
  - Mitigation measures preventing seepage of muddy water
  - Sorting and storage of general refuse and construction waste
- A.7 Five (5) sessions of air monitoring were carried out at all designated monitoring locations. No exceedance of Action or Limit Level was recorded.
- A.8 Four (4) sessions of noise monitoring were carried out at all designated monitoring locations. No exceedance of Action or Limit Level was recorded.
- A.9 Results of the monitoring for air quality and airborne noise are given in **Table A** and **Table B** as follows:

**Table A – Monitoring Results (Dust)**

Location	Dust in $\mu\text{g}/\text{m}^3$			
	Average		Range	
	TSP-1hr	TSP-24hr	TSP-1hr	TSP-24hr
A1a	77.5	116	65 - 90	71 - 149
A2a	72.3	97	61 - 79	39 - 139

**Table B – Monitoring Results (Noise)**

Location	Noise in dB(A)	
	Average	Range
	$L_{\text{eq}}(30 \text{ min})$ (7:00-19:00)	$L_{\text{eq}}(30 \text{ min})$ (7:00-19:00)
N2a	72.5	70.3 - 74.4
N3a	71.8	66.8 - 73.5

s: +3 dB(A) free-field corrections have been made to N3a.

- A.10 According to Section 4.3.3 of the EM&A Manual, Site inspection shall be carried out by the ET and attentions shall be paid to the mitigation measures recommended for water pollution control. Weekly site inspections were carried out and no non-compliance was spotted during the reporting month.
- A.11 Waste management mitigation measures were properly implemented in the reporting period.
- A.12 For cultural heritage impact, as this Project does not involve proposed sewers works, according to Section 6.1.5 of the EM&A Manual, no EM&A requirement is considered necessary during the construction and operational phase of upgrading of Cheung Chau STW and Pak She SPS.
- A.13 The recommended landscape and visual mitigation measures were properly implemented in the reporting period.
- A.14 Weekly site inspection of the construction work by ET were carried out on 06, 12, 20 and 28 December 2022.
- A.15 No environmental complaint was received during the reporting period.
- A.16 No notification of summons or prosecution was received in the reporting period.
- A.17 A map of the construction site and monitoring locations are shown in [Appendix A](#).
- A.18 The summary of permit / licences for this Project is presented in **Table C** below:

**Table C – Summary of Permit / Licences**

<b>Nature</b>	<b>Number</b>	<b>Issue Date</b>	<b>Expiry Date</b>
Environmental Permit	EP-488/2014/A	13/05/2021	N/A
Notification pursuant to Air Pollution Control (Construction Dust) Regulation	462303	26/11/2020	N/A
Waste Disposal Billing Account	7039094	7/12/2020	N/A
Waste Disposal (Vessel) Billing Account	7040870	28/09/2022	10/01/2023
		28/12/2022	10/04/2023
Chemical Waste Producer	5213-920-B2500-05	31/12/2020	N/A
Effluent Discharge Licence under Water Pollution Control Ordinance	WT00038597-2021	20/08/2021	31/08/2026

## 1. INTRODUCTION

### 1.1. BACKGROUND

- 1.1.1.** Drainage Services Department (DSD) has contracted Build King Civil Engineering Limited (BK) to carry out the Outlying Islands Sewerage Stage 2 – Upgrading of Cheung Chau Sewage Collection, Treatment and Disposal Facilities under Contract No. DC/2019/07.
- 1.1.2.** Acuity Sustainability Consulting Limited (ASCL) is commissioned by BK to undertake the Environmental Team (ET) services as required and/or implied, both explicitly and implicitly, in the Environmental Permit (EP), Environmental Impact Assessment Report (EIA Report) (Register No. AEIAR-181/2013) and Environmental Monitoring and Audit Manual (EM&A Manual) for the Project; and to carry out the Environmental Monitoring and Audit (EM&A) programme in fulfillment of the EIA Report's EM&A requirements under Agreement No. CE 15/2010 (DS).

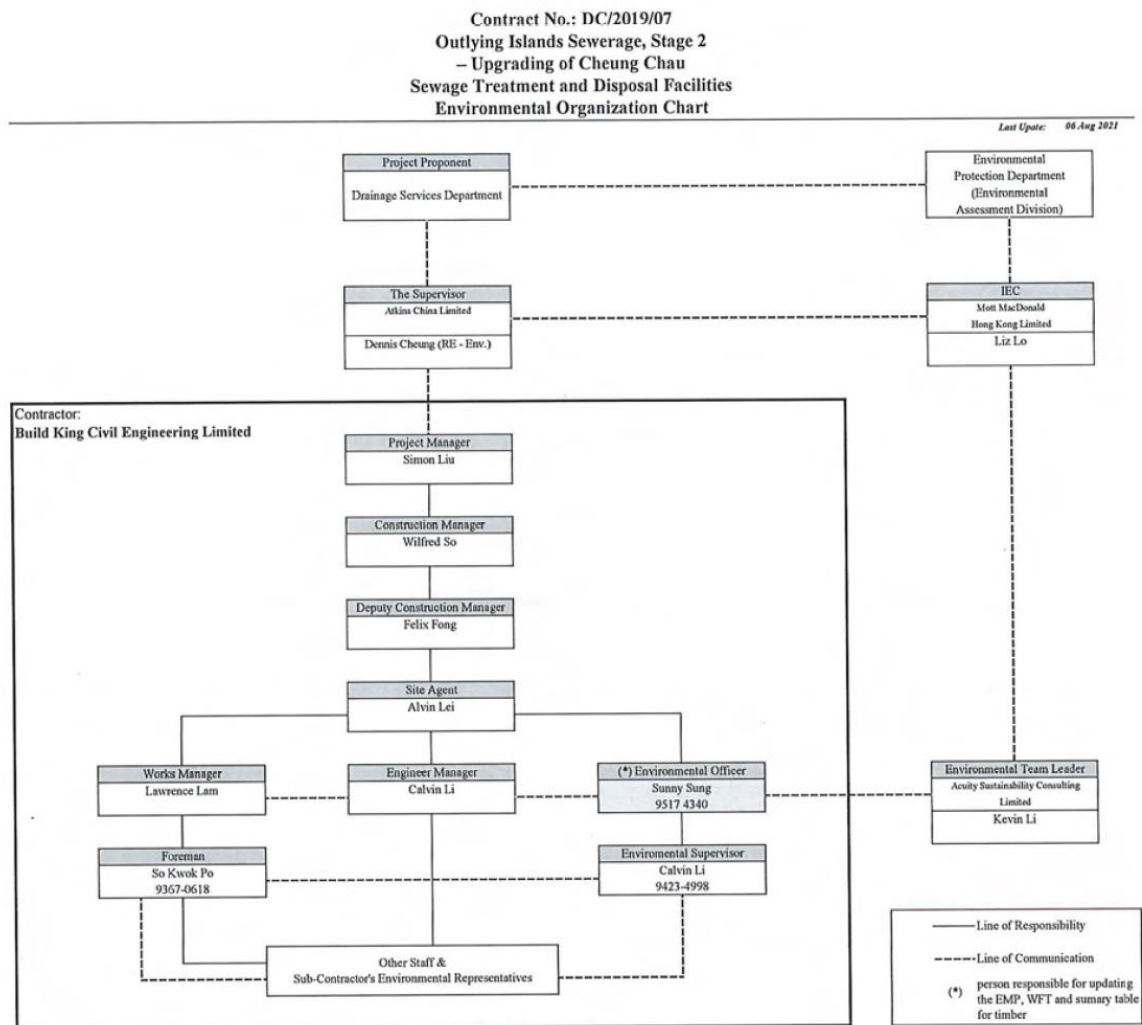
### 1.2. PROJECT DESCRIPTION

- 1.2.1.** The purpose of the Project is to upgrade the sewerage collection, treatment and disposal facilities in Cheung Chau in order to cater for the projected ultimate population and planned developments in Cheung Chau to meet the increased demand and to achieve more stringent effluent quality standards. The key elements of the proposed works for the Project will include as follows:
- Expansion of the sewage treatment capacity and upgrading of the treatment level of the existing Cheung Chau Sewage Treatment Works (Cheung Chau STW) to secondary treatment level; and
  - Expansion of the pumping capacity of the existing Pak She Sewage Pumping Station (Pak She SPS).

### 1.3. PROJECT ORGANISATION STRUCTURE

- 1.3.1.** The Project organization structure is presented in **Figure 1.1**.

**Figure 1.1 Project Organization Structure**



Party	Role	Contact Person	Phone No.
Drainage Services Department HKSAR (DSD)	Project Proponent	C.K. NG	2594 7264
Supervisor / Supervisor's Representative (Atkins China Limited)	Resident Engineer	Dennis Cheung	2675 3910
Environmental Team (Acuity Sustainability Consulting Limited)	Environmental Team Leader	Kevin Li	2698 6833
Independent Environmental Checker (Mott Macdonald Hong Kong Limited)	Independent Environmental Checker	Liz Lo	2828 5751
Contractor (Build King Construction Limited)	Site Agent	Alvin Lei	6123 8136
	Environmental Officer	Sunny Sung	9517 4340

#### **1.4. SUMMARY OF CONSTRUCTION WORKS**

**1.4.1.** Details of the major construction activities undertaken in this and the next reporting periods are shown as below. The construction programme is presented in **Appendix B**.

Key activities carried out in this reporting period for the Project included the followings:

- Trial pit and ground investigation
- Smart sewage monitoring
- Pre-bored Works for Sheet Piles Installation for Subsequent ELS at CCSTW
- Repair Works for Existing Sludge Ramp
- Excavation and Lateral Support (ELS) at CCSTW
- Mechanical Installation Works of Pak She Sewage Pumping Station
- Construction of Superstructure of LV Main Switch Room and Transformer Room at CCSTW
- Construction of Sludge Digester Building

Key activities to be carried out in the next reporting period for the Project included the followings:

- Trial pit and ground investigation
- Smart sewage monitoring
- Pre-bored Works for Sheet Piles Installation for Subsequent ELS at CCSTW
- Repair Works for Existing Sludge Ramp
- Excavation and Lateral Support (ELS) at CCSTW
- Mechanical Installation Works of Pak She Sewage Pumping Station
- Mechanical Installation Works of Temporary Digestion System
- Construction of Superstructure of LV Main Switch Room and Transformer Room at CCSTW
- Construction of Sludge Digester Building

#### **1.5. PURPOSE OF THE REPORT**

**1.5.1.** According to the EM&A Manual for the Project, monitoring for air quality and noise should be conducted throughout the construction period of the Project.

**1.5.2.** The EM&A requirements for environmental monitoring are set out in the EM&A Manual. Environmental aspect of construction noise and air quality were identified as the key issues requiring implementation of monitoring programme during the construction phase of the Project.

**1.5.3.** This report is summarizing the monitoring results and audit findings of the EM&A programme during the reporting period from 1 December to 31 December 2022.

## **2. AIR QUALITY**

### **2.1. AIR QUALITY PARAMETERS**

**2.1.1.** The air quality parameters to be monitored includes:

- 24-hour TSP;
- 1-hour TSP; and

### **2.2. MONITORING CRITERIA**

**2.2.1.** Dust monitoring was carried out at the designated monitoring location at least once in every six-days to obtain 24-hour TSP samples. One-hour TSP sampling shall also be done at least 3 times in every six-days while the highest dust impact occurs.

**2.2.2.** Before commencing the impact monitoring, the ET Leader shall inform the IEC of the impact monitoring programme such that the IEC can conduct on-site audit to ensure accuracy of the impact monitoring results.

**2.2.3.** In case of non-compliance with the air quality criteria, additional monitoring as specified in the Action Plan shall be conducted within 24 hours after the result is obtained. This additional monitoring shall be continued until the excessive dust emission or the deterioration in air quality is rectified.

### **2.3. MONITORING REQUIREMENTS AND EQUIPMENT**

**2.3.1.** 1-hour and 24-hour TSP levels were measured to indicate the impacts of construction dust on air quality. The 24-hour TSP levels shall be measured by following the standard high volume sampling method as set out in the Title 40 of the United States Code of Federal Regulations, Chapter 1 (Part 50), Appendix B.

**2.3.2.** High volume samplers (HVSs) in compliance with the following specifications shall be used for carrying out the 1-hour and 24-hour TSP monitoring:

- (i) 0.6 – 1.7 m<sup>3</sup> per minute adjustable flow range;
- (ii) equipped with a timing / control device with +/- 5 minutes accuracy for 24 hours operation;
- (iii) installed with elapsed-time meter with +/- 2 minutes accuracy for 24 hours operation;
- (iv) capable of providing a minimum exposed area of 406 cm<sup>2</sup>;
- (v) flow control accuracy: +/- 2.5% deviation over 24-hour sampling period;
- (vi) equipped with a shelter to protect the filter and sampler;
- (vii) incorporated with an electronic mass flow rate controller or other equivalent devices;
- (viii) equipped with a flow recorder for continuous monitoring;
- (ix) provided with a peaked roof inlet;
- (x) incorporated with a manometer;
- (xi) able to hold and seal the filter paper to the sampler housing at horizontal position;
- (xii) easily changeable filter; and

(xiii) capable of operating continuously for a 24-hour period.

- 2.3.3.** The ET is responsible for provision of the monitoring equipment. They shall ensure that sufficient number of HVSs with an appropriate calibration kit is available for carrying out the impact monitoring, and ad hoc monitoring. The HVSs shall be equipped with an electronic mass flow controller and be calibrated against a traceable standard at regular intervals. All the equipment, calibration kit, filter papers, etc., shall be clearly labelled.
- 2.3.4.** Initial calibration of dust monitoring equipment shall be conducted upon installation and thereafter at bi-monthly intervals. The transfer standard shall be traceable to the internationally recognised primary standard and be calibrated annually. The concerned parties such as ER shall properly document the calibration data for future reference. All the data shall be converted into standard temperature and pressure condition.
- 2.3.5.** If the ET proposes to use a direct reading dust meter to measure 1-hour TSP levels, he shall submit sufficient information to the ER to prove that the instrument is capable of achieving a comparable result to the HVS. The instrument shall also be calibrated regularly, and the 1-hour sampling shall be determined periodically by the HVS to check the validity and accuracy of the results measured by direct reading method.

#### Laboratory Measurement / Analysis

- 2.3.6.** A clean laboratory with constant temperature and humidity control, and equipped with necessary measuring and conditioning instruments to handle the dust samples collected, shall be available for sample analysis, and equipment calibration and maintenance. The laboratory shall be HOKLAS accredited.
- 2.3.7.** Filter paper of size 8" x 10" shall be labelled before sampling. It shall be a clean filter paper with no pinholes, and shall be conditioned in a humidity-controlled chamber for over 24-hours and be pre-weighed before use for the sampling
- 2.3.8.** After sampling, the filter paper loaded with dust shall be kept in a clean and tightly sealed plastic bag. The filter paper shall then be returned to the laboratory for reconditioning in the humidity-controlled chamber followed by accurate weighing by an electronic balance with readout down to 0.1 mg. The balance shall be regularly calibrated against a traceable standard.
- 2.3.9.** 1-hour TSP levels and 24-hour TSP had been measured with direct reading dust meters and High Volume Samplers respectively. The details of equipment used for monitoring are listed in **Table 2.1**, and the calibration certificates are presented in [Appendix C](#).

**Table 2.1 Equipment Used for Air Quality Monitoring**

<b>Equipment</b>	<b>Model</b>	<b>Serial Number</b>
Portable dust meter – 1-hour TSP	SIBATA Digital Dust Indicator (Model: LD-5R)	761173 992821 851820 0Z4544
High Volume Samplers – 24- hour TSP	Tisch TE-5170X High Volume Air Sampler	1048 1085
Calibrator Kit	Tisch TE-5025A Calibration Kit	3465



## 2.4. MONITORING LOCATIONS

**2.4.1.** The ET agreed with the ER and the IEC on the position of the HVS for the installation of the monitoring equipment. When positioning the samplers, the following points were noted:

- (i) a horizontal platform with appropriate support to secure the samplers against gusty wind shall be provided;
- (ii) no two samplers shall be placed less than 2 meters apart;
- (iii) the distance between the sampler and an obstacle, such as buildings, must be at least twice the height that the obstacle protrudes above the sampler;
- (iv) a minimum of 2 meters of separation from walls, parapets and penthouses is required for rooftop samplers;
- (v) a minimum of 2 meters separation from any supporting structure, measured horizontally is required;
- (vi) no furnace or incinerator flue is nearby;
- (vii) airflow around the sampler is unrestricted;
- (viii) the sampler is more than 20 meters from the dripline;
- (ix) any wire fence and gate, to protect the sampler, shall not cause any obstruction during monitoring
- (x) permission must be obtained to set up the samplers and to obtain access to the monitoring stations; and
- (xi) a secured supply of electricity is needed to operate the samplers.

**2.4.2.** The proposed dust monitoring station is presented in **Table 2.2** and the respective locations are shown in Figure 2.1 of the EM&A Manual.

**Table 2.2 Proposed Dust Monitoring Stations**

ID No.	Location	Nature of Use	Remarks
A1	Cheung King House, Cheung Kwai Estate	Residential	Specified in the EM&A Manual but proposed to change location
A1a	The admin building inside the construction site	Institutional	Proposed alternative location to replace A1
A2	Cheung Chau Slaughter House	Slaughter house	Specified in the EM&A Manual but proposed to change location
A2a	The existing outfall pumping station inside the construction site	Institutional	Proposed alternative location to replace A2


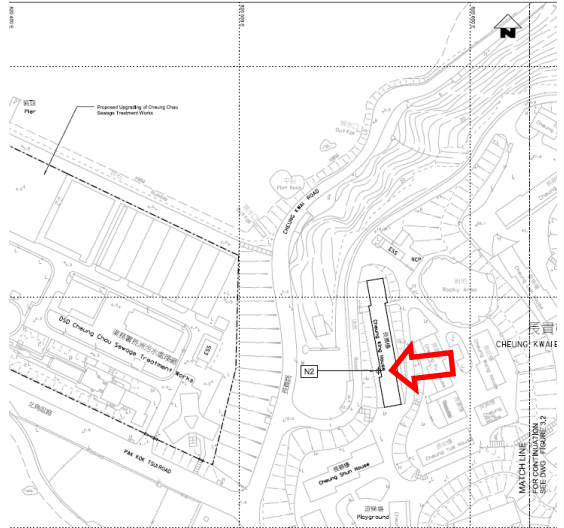

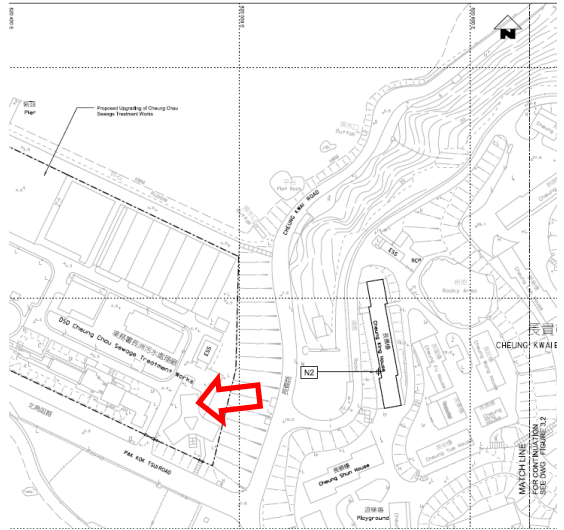
**2.4.3.** As secured electricity supply was not able to be provided at Monitoring Station A1, Monitoring Station A1a was then proposed, The proposed Monitoring Station A1a is the Admin Building inside the construction site. It is located at a similar direction as A1 from the construction site, but much closer to any major dust emission source than A1.


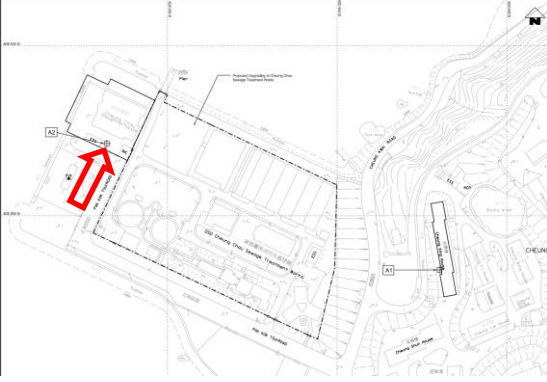
**2.4.4.** Monitoring Station A2 is now abandoned, only limited access can be granted and power supply cannot be guaranteed which may not be feasible to be a monitoring location. An alternative location A2a, which is the existing outfall pumping station Building inside the

construction site. Location A2a is about 30 meter away from the Cheung Chau slaughter house and closer to the dust emission source.

2.4.5. The proposed alternative monitoring locations meet the guidelines and requirements specified in Section 2.4.1 and 2.4.2 of the EM&A Manual. **Table 2.3** shows the photographs of the air monitoring locations.

**Table 2.3 Photo of Proposed HVS Position at Dust Monitoring Stations**

ID	HVS Postion	Direction of Photo
A1		
<p>The proposed Monitoring Station A1a is the Admin Building inside the construction site. It is located at a similar direction as A1 from the construction site, but much closer to any major dust emission source than A1.</p>		
A1a		

ID	HVS Postion	Direction of Photo
A2		

Because Monitoring Station A2 is now abandoned, only limited access can be granted and power supply cannot be guaranteed which may not feasible to be a monitoring location.

A2a		
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## 2.5. RESULTS AND ANALYSIS

2.5.1. The 1-hour TSP and 24-hour TSP measurement data are shown in [Appendix D](#) and summarized in **Table 2.4** and **Table 2.5** respectively .

**Table 2.4 Summary of 1-hour TSP Monitoring Results**

Monitoring Location	Average( $\mu\text{g}/\text{m}^3$ )	Range( $\mu\text{g}/\text{m}^3$ )
A1a	77.5	65 - 90
A2a	72.3	61 - 79

**Table 2.5 Summary of 24-hour TSP Monitoring Results**

Monitoring Location	Average( $\mu\text{g}/\text{m}^3$ )	Range( $\mu\text{g}/\text{m}^3$ )
A1a	116	71 - 149
A2a	97	39 - 139

## 2.6. ENVIRONMENTAL QUALITY PERFORMANCE LIMITS

2.6.1. The baseline monitoring results formed the basis for determining the air quality criteria for the impact monitoring. The ET shall compare the impact monitoring results with air quality criteria set up for 24-hour TSP and 1-hour TSP. **Table 2.6** shows the air quality criteria, namely Action and Limit levels to be used.

**Table 2.6 Action / Limit Levels for Air Quality**

Parameters	Action Level	Limit Level
1-hour TSP Level in $\mu\text{g}/\text{m}^3$	For baseline level $\leq 200 \mu\text{g}/\text{m}^3$ $AL = (BL * 1.3 + LL)/2$ For baseline level $> 200 \mu\text{g}/\text{m}^3$ $AL = LL$	260 $\mu\text{g}/\text{m}^3$
24-hour TSP Level in $\mu\text{g}/\text{m}^3$	For baseline level $\leq 384 \mu\text{g}/\text{m}^3$ $AL = (BL * 1.3 + LL)/2$ For baseline level $> 384 \mu\text{g}/\text{m}^3$ $AL = LL$	500 $\mu\text{g}/\text{m}^3$

2.6.2. The derived Action/Limit Levels are presented in **Table 2.7**.

**Table 2.7 Derived Action / Limit Levels for Air Quality**

Parameters	Monitoring Location	Action Level $\mu\text{g}/\text{m}^3$	Limit Level $\mu\text{g}/\text{m}^3$
1-hour TSP Level in $\mu\text{g}/\text{m}^3$	A1a	151	260
	A2a	154	
24-hour TSP Level in $\mu\text{g}/\text{m}^3$	A1a	270	500
	A2a	271	

## 2.7. EVENT AND ACTION PLAN

2.7.1. Should non-compliance of the air quality criteria occur, actions in accordance with the Action Plan in **Table 2.8** shall be carried out.

**Table 2.8 Event and Action Plan for Air Quality (Construction Dust)**

Contract No. DC/2019/07  
 Environmental Monitoring Works for  
 Upgrading of Cheung Chau Sewage Collection, Treatment and Disposal Facilities  
 17<sup>th</sup> EM&A Report – December 2022

EVENT	ACTION PLAN FOR CONSTRUCTION DUST			
	ET	IEC	ER	CONTRACTOR
<b>ACTION LEVEL</b>				
Exceedance for one sample	<ol style="list-style-type: none"> <li>1. Identify source, investigate the causes of exceedance and propose remedial measures;</li> <li>2. Inform IEC and ER;</li> <li>3. Repeat measurement to confirm finding; and</li> <li>4. Increase monitoring frequency to daily.</li> </ol>	<ol style="list-style-type: none"> <li>1. Check monitoring data submitted by ET; and</li> <li>2. Check Contractor's working method.</li> </ol>	<ol style="list-style-type: none"> <li>1. Notify Contractor.</li> </ol>	<ol style="list-style-type: none"> <li>1. Rectify any unacceptable practice; and</li> <li>2. Amend working methods if appropriate.</li> </ol>
Exceedance for two or more consecutive samples	<ol style="list-style-type: none"> <li>1. Identify source;</li> <li>2. Inform IEC and ER;</li> <li>3. Advise the ER on the effectiveness of the proposed remedial measures;</li> <li>4. Repeat measurements to confirm findings;</li> <li>5. Increase monitoring frequency to daily;</li> <li>6. Discuss with IEC and Contractor on remedial actions required;</li> <li>7. If exceedance continues, arrange meeting with IEC and ER; and</li> <li>8. If exceedance stops, cease additional monitoring.</li> </ol>	<ol style="list-style-type: none"> <li>1. Check monitoring data submitted by ET;</li> <li>2. Check Contractor's working method;</li> <li>3. Discuss with ET and Contractor on possible remedial measures;</li> <li>4. Advise the ET on the effectiveness of the proposed remedial measures; and</li> <li>5. Supervise implementation of remedial measures</li> </ol>	<ol style="list-style-type: none"> <li>1. Confirm receipt of notification of failure in writing;</li> <li>2. Notify Contractor; and</li> <li>3. Ensure remedial measures properly implemented.</li> </ol>	<ol style="list-style-type: none"> <li>1. Submit proposals for remedial to IEC within 3 working days of notification;</li> <li>2. Implement the agreed proposals; and</li> <li>3. Amend proposal if appropriate.</li> </ol>



### 3. NOISE

#### 3.1. MONITORING CRITERIA

- 3.1.1. Impact monitoring was conducted once a week between 07:00-19:00 hours on normal weekdays.
- 3.1.2. **Table 3.1** summarizes the monitoring parameters, frequency and duration of the noise monitoring.

**Table 3.1 Noise Monitoring Parameters, Time, Frequency and Duration**

Time	Duration	Interval	Parameters
Daytime: 0700-1900 hrs	Once per week	Continuously in L <sub>eq</sub> 5min/L <sub>eq</sub> 30min (average of 6 consecutive L <sub>eq</sub> 5min)	L <sub>eq</sub> 5min, L <sub>eq</sub> 30min, L <sub>10</sub> & L <sub>90</sub>

#### 3.2. MONITORING REQUIREMENTS AND EQUIPMENT

- 3.2.1. Sound level meters and calibrators shall comply with the International Electrotechnical Commission Publications 651: 1979 (Type 1) and 804: 1985 (Type 1) specification as referred to in the Technical Memorandum (TM) issued under the Noise Control Ordinance.
- 3.2.2. Sound level meters were calibrated using a portable calibrator prior to and following each noise measurement. Where the difference between the calibration levels is greater than 1.0 dB(A), the measurement shall be repeated. Calibrated hand-held anemometers were supplied for the measurement of wind speeds during noise monitoring periods.
- 3.2.3. Noise measurements should not be made in fog, rain, wind with a steady speed exceeding 5 m/s or wind with gusts exceeding 10 m/s. The wind speed shall be checked with a portable wind speed meter capable of measuring the wind speed in m/s.
- 3.2.4. The details of equipment used for impact monitoring are listed in **Table 3.2**, and the calibration certificates are presented in [Appendix E](#).

**Table 3.2 Equipment Used for Noise Monitoring**

Equipment	Model	Serial Number
Sound Level Meter	SVANTEK 971	103482
Sound Level Meter	XL2	A2A-13663-E0
Acoustic Calibrator	Rion NC-75	34724244 34724243

#### 3.3. MONITORING LOCATION

- 3.3.1. According to the environmental findings detailed in the EIA report, the designated locations for the construction noise monitoring are listed in **Table 3.3** and shown in Figure 3.1 – 3.8 of the EM&A Manual.

**Table 3.3 Noise Monitoring Stations for Noise Monitoring**

ID No.	Location	Nature of Uses	Remarks	Façade/Free-field
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N2	Cheung King House, Cheung Kwai Estate	Residential	Specified in the EM&A Manual but proposed to change location	Façade
N2a	Admin Building inside the Construction Site	Institutional	Proposed alternative location to replace N2	Façade
N3	No. 1A Pak She Second Lane	Residential	Specified in the EM&A Manual but proposed to change location	Free-field
N3a	Cheung Chau Fire Station	Fire Station	Proposed alternative location to replace N3	Free-field


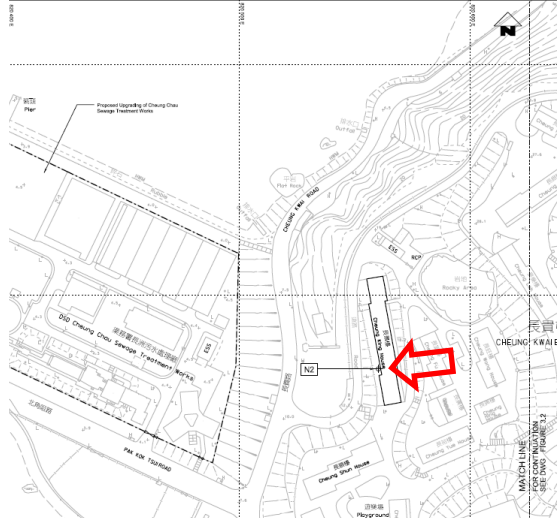
**3.3.2.** For this Contract, only N2 and N3 need to be monitored since all the other monitoring stations specified in the EM&A Manual are for sewers works but this Contract does not include sewers works.

**3.3.3.** The proposed Monitoring Station N2a is the Admin Building inside the construction site. It is located at a similar direction as N2 from the construction site, but much closer to any major noise emission source than N2.

**3.3.4.** According to Figure 3.3 of the EM&A Manual, Location N3 is placed in front of a restaurant on Ping Chong Road. It may pose potential danger to pedestrians, cyclists, drivers and the equipment. A proposed monitoring location N3a, which is about 5 m away from the original monitoring location. N3a is at the corner of the Cheung Chau Fire Station. This location is more safe and meets the guidelines and requirements specified in Section 3.4.1 and 3.4.2 of the EM&A Manual.

**3.3.5.** The monitoring locations should normally be made at a point 1m from the exterior of the NSRs building façade and be at a position 1.2m above the ground. **Table 3.4** showed photographs and indications of the proposed position of sound level meters to be placed for the baseline and impact monitoring.

**Table 3.4 Photo of Proposed Sound Level Meter Position at Noise Monitoring Stations**

ID	Sound Level Meter Postion	Direction of Photo
N2		


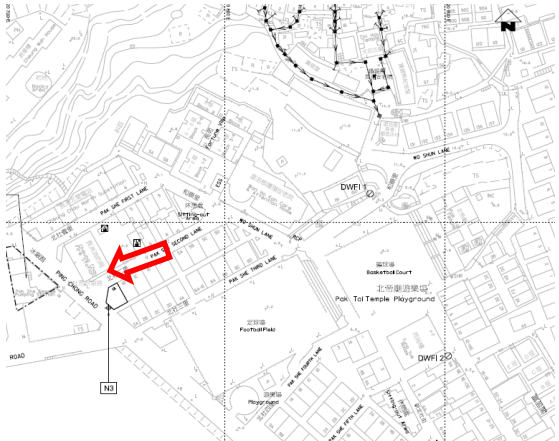
The proposed Monitoring Station N2a is the Admin Building inside the construction site. It is located at a similar direction as N2 from the construction site, but much closer to any major noise emission source than N2.

N2a		
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N3		
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According to Figure 3.3 of the EM&A Manual, Location N3 is placed in front of a restaurant on Ping Chong Road. It may pose potential danger to pedestrians, cyclists, drivers and the equipment.



ID	Sound Level Meter Postion	Direction of Photo
N3a		

### 3.4. RESULTS AND ANALYSIS

3.4.1. The noise monitoring was carried out in Decmeber 2022. The measurement data are shown in [Appendix F](#) and summarized in **Tables 3.5**.

**Table 3.5 Summary of Noise Monitoring Results**

Monitoring Location	Time Period	Average[dB(A)]	Range[dB(A)]
N2a	Daytime (0700-1900)	72.5	70.3 – 74.4
N3a	Daytime (0700-1900)	71.8	66.8 – 73.5

s: +3 dB(A) free-field corrections have been made to the data of N3a.

### 3.5. ENVIRONMENTAL QUALITY PERFORMANCE LIMITS

3.5.1. The Action and Limit levels for construction noise are shown in **Table 3.6**. All NSRs identified in the Project are classified with an Area Sensitivity Rating (ASR) A in accordance with the Technical Memorandum on Noise from Construction Work Other Than Percussive Piling.

**Table 3.6 Action / Limit Levels for Construction Noise**

Time Period	Action	Limit
07:00-19:00 hours on normal weekdays;	When one or more documented complaints are received	75dB(A)

### 3.6. EVENT AND ACTION PLAN

3.6.1. Should non-compliance of the noise monitoring criteria occur, actions in accordance with the Action Plan in **Table 3.7** shall be carried out.

**Table 3.7 Event and Action Plan for Construction Noise**

Event	ET	IEC	ER	CONTRACTOR
Action Level	<ol style="list-style-type: none"> <li>1. Notify ER, IEC and Contractor;</li> <li>2. Carry out investigation;</li> <li>3. Report the results of investigation to the IEC, ER and Contractor;</li> <li>4. Discuss with the IEC and contractor and formulate remedial measures; and</li> <li>5. Increase monitoring frequency to check the effectiveness of mitigation measures.</li> </ol>	<ol style="list-style-type: none"> <li>1. Review the investigation results submitted by the ET;</li> <li>2. Review the proposed remedial measures by the Contractor and advise the ER accordingly; and</li> <li>3. Advise the ER on the effectiveness of the proposed remedial measures.</li> </ol>	<ol style="list-style-type: none"> <li>1. Confirm receipt of notification of failure in writing;</li> <li>2. Notify Contractor;</li> <li>3. In consolidation with the IEC, agree with the Contractor on the remedial measures to be implemented; and</li> <li>4. Supervise the implementation of remedial measures.</li> </ol>	<ol style="list-style-type: none"> <li>1. Submit noise mitigation proposals to IEC and ER; and</li> <li>2. Implement noise mitigation proposals.</li> </ol>
Limit Level	<ol style="list-style-type: none"> <li>1. Notify IEC, ER, EPD &amp; Contractor;</li> <li>2. Identify source and investigate the cause of exceedance;</li> <li>3. Repeat measurement to confirm findings;</li> <li>4. Increase monitoring frequency;</li> <li>5. Carry out analysis of Contractor's working procedures to determine possible mitigation to be implemented;</li> <li>6. Discuss with the IEC, Contractor and ER on remedial measures required;</li> <li>7. Assess the effectiveness of Contractor's remedial actions and keep IEC, EPD and ER informed of the results; and</li> <li>8. If exceedance stops, cease additional monitoring.</li> </ol>	<ol style="list-style-type: none"> <li>1. Discuss amongst ER, ER and Contractor on the potential remedial actions; and</li> <li>2. Review Contractor's remedial actions whenever necessary to assure their effectiveness and advise the ER accordingly.</li> </ol>	<ol style="list-style-type: none"> <li>1. Confirm receipt of notification of failure in writing;</li> <li>2. Notify Contractor;</li> <li>3. In consolidation with the EIC, agree with the Contractor on the remedial measures to be implemented;</li> <li>4. Supervise the implementation of remedial measures; and</li> <li>5. If exceedance continues, consider stopping the Contractor to continue working on that portion of work which causes the exceedance until the exceedance is abated.</li> </ol>	<ol style="list-style-type: none"> <li>1. Take immediate action to avoid further exceedance;</li> <li>2. Submit proposals for remedial actions to IEC and ER within 3 working days of notification;</li> <li>3. Implement the agreed proposals;</li> <li>4. Submit further proposal if problem still not under control; and</li> <li>5. Stop the relevant portion of works as determined by ER, until the exceedance is abated.</li> </ol>

#### 4. WATER QUALITY

- 4.1. As suggested in Section 4.3 of the EM&A Manual, regular site audit was carried out to ensure that the recommended mitigation measures were properly implemented during the construction phase of upgrading of Cheung Chau STW and Pak She SPS. Site audit included site inspections and compliance audits were conducted in the reporting period.
- 4.2. Site inspection was carried out by the ET on 06, 12, 20 and 28 December 2022. No major deficiency was observed and the implementation of recommended for water pollution control was considered satisfactory.
- 4.3. Compliance audits were undertaken that a valid discharge license was issued by EPD on 20 August 2021. The Contractor was reminded to make sure any effluent discharge from construction activities of the Project site should meet the requirements stipulated in the discharge license and monitoring of the treated effluent quality from the Works Areas should be carried out in accordance with the Water Pollution Control Ordinance license that is under the ambit of the relevant regional EPD office .
- 4.4. According to the Specific Conditions B2 in Part B of the discharge licence issued under WPCO, a sample of discharge was taken in December 2022 for testing. Due to the delay of laboratory result, the result will be presented in the next EM&A monthly report.

#### 4.5.

#### 5. WASTE MANAGEMENT

- 5.1. The waste generated from this Project includes inert construction and demolition (C&D) materials, and non-inert C&D materials. Non-inert C&D materials are made up of general refuse, vegetative wastes and recyclable wastes such as plastics and paper/cardboard packaging waste. Steel materials generated from the project are also grouped into non-inert C&D materials as the materials were not disposed of with other inert C&D materials. With reference to relevant handling records and trip tickets of this Project, the quantities of different types of waste generated in the reporting month are presented in **Table 5.1**.

Contract No. DC/2019/07  
 Environmental Monitoring Works for  
 Upgrading of Cheung Chau Sewage Collection, Treatment and Disposal Facilities  
 17<sup>th</sup> EM&A Report – December 2022



**Contract No: DC/2019/07**  
 Outlying Islands Sewerage Stage 2 – Upgrading of Cheung Chau Sewage Treatment and Disposal Facilities

Name of Department : Drainage Services Department Contract No./ Work Order No. : DC/2019/07  
 Project Title: Outlying Islands Sewerage Stage 2 – Upgrading of Cheung Chau Sewage Treatment and Disposal Facilities  
 Contractor: Build King Civil Engineering Limited  
 Trip Ticket Account (Main Account): 7039094  
 Trip Ticket Account (Vessel Account): 7040870

**Monthly Summary Waste Flow Table for 2022 (in Weight)**

**Table 5.1**

(All quantities shall be rounded off to 3 decimal places) updated on: 03-Oct-2022

Month	Actual Quantities of Inert C&D Materials Generated / Imported (in '000 kg)						Actual Quantities of Other C&D Materials / Wastes Generated				
	Total Quantities Generated	Broken Concrete (including rock for recycling into aggregates)	Reused in the Contract	Reused in Other Projects	Disposed as Public Fill	Imported C&D Material	Metal	Paper/ Cardboard Packaging (f)	Plastic (g) (bottles/containers, plastic sheets/ foams from packaging material)	Chemical Waste (h)	Others (i) (e.g. General Refuse etc.)
	[a+b+c+d+e-f+g+h+i]	(a)	(b)	(c)	(d)	(e)	(in '000kg)	(in '000kg)	(in '000kg)	(in '000kg)	(in '000kg)
Jan-2022	42.0400	0.0000	0.0000	0.0000	40.5200	0.0000	0.0000	0.0000	0.0000	1.5200	
Feb-2022	1.3800	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	1.3800	
Mar-2022	2736.9100	0.0000	0.0000	0.0000	2735.9500	0.0000	0.0000	0.0000	0.0000	0.9600	
Apr-2022	1357.0800	0.0000	0.0000	0.0000	1353.9000	0.0000	0.0000	0.0000	0.0000	3.1800	
May-2022	1888.2200	0.0000	0.0000	0.0000	1885.0000	0.0000	0.0000	0.0000	0.0000	3.2200	
Jun-2022	1319.8900	0.0000	0.0000	0.0000	1313.0000	0.0000	0.0000	0.0000	0.0000	6.8900	
Half-year total	7345.5200	0.0000	0.0000	0.0000	7328.3700	0.0000	0.0000	0.0000	0.0000	17.1500	
Jul-2022	3144.6400	0.0000	0.0000	0.0000	3140.0000	0.0000	0.0000	0.0000	0.0000	4.6400	
Aug-2022	2907.2200	0.0000	0.0000	0.0000	2902.0000	0.0000	0.0000	0.0000	0.0000	5.2200	
Sep-2022	4.3700	0.0000	0.0000	0.0000	3.7300	0.0000	0.0000	0.0000	0.0000	0.6400	
Oct-2022	2.4000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	2.4000	
Nov-2022	17.3400	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	17.3400	
Dec-2022	3660.2300	0.0000	0.0000	0.0000	3658.2700	0.0000	0.0000	0.0000	0.0000	1.9600	
Yearly Total	17081.7200	0.0000	0.0000	0.0000	17032.3700	0.0000	0.0000	0.0000	0.0000	49.3500	

(All quantities shall be rounded off to 3 decimal places)

Year	Actual Quantities of Inert C&D Materials Generated / Imported (in '000 kg)						Actual Quantities of Other C&D Materials / Wastes Generated				
	Total Quantities Generated	Broken Concrete (including rock for recycling into aggregates)	Reused in the Contract	Reused in Other Projects	Disposed as Public Fill	Imported C&D Material	Metal	Paper/ Cardboard Packaging	Plastic (bottles/containers, plastic sheets/ foams from packaging material)	Chemical Waste	Others (e.g. General Refuse etc.)
	[a+b+c+d+e-f+g+h+i]	(a)	(b)	(c)	(d)	(e)	(in '000kg)	(in '000kg)	(in '000kg)	(in '000kg)	(in '000kg)
2020	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	
2021	858.3600	0.0000	0.0000	0.0000	786.3000	0.0000	0.0000	0.0000	0.0000	72.0600	
2022	17081.7200	0.0000	0.0000	0.0000	17032.3700	0.0000	0.0000	0.0000	0.0000	49.3500	
2023	0.0000										
2024	0.0000										
2025	0.0000										
2026	0.0000										
Total	17940.0800	0.0000	0.0000	0.0000	17818.6700	0.0000	0.0000	0.0000	0.0000	121.4100	

Remark:

- 1) Density of C&D material to be 2 metric ton/m<sup>3</sup>      3) Density of Chemical Waste to be 0.88 metric ton/m<sup>3</sup>  
 2) Density of General Refuse to be 1.6 metric ton/m<sup>3</sup>

Notes:

- (1) The waste flow table shall also include C&D materials that are specified in the Contract to be imported for use at the Sites.  
 (2) Plastics refer to plastic bottles/containers, plastic sheets/foam from packaging material.  
 (3) The summary table shall be submitted to the Project Manager monthly together with the Waste Flow Table for review and monitoring in accordance with the PS Clause 25.20(8)

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## 6. LANDSCAPE & VISUAL

- 6.1. The EIA Report has recommended landscape and visual mitigation measures to be undertaken during construction and operational phases of the upgrading of Cheung Chau STW under this Project. The implementation and maintenance of landscape mitigation measures were checked to ensure that they are fully realised and that potential conflicts between the proposed landscape measures and any other project works and without compromise to the intention of the mitigation measures.
- 6.2. Regular audits were carried out to ensure all the recommended landscape and visual mitigation measures were effectively implemented.
- 6.3. The EM&A Manual proposed mitigation measures were checked on a regular basis to ensure compliance with the intended aims of the EIA.

## 6.4.

## 7. SITE INSPECTION AUDIT

- 7.1. Site inspections were carried out on a weekly basis to monitor the implementation of proper environmental pollution control and mitigation measures under the Contract. In the reporting period, site inspections were carried out on 06, 12, 20 and 28 December 2022. A joint site inspection with IEC was carried out on 12 December 2022.
- 7.2. Environmental deficiencies were observed during weekly site inspection. Key observations during the site inspections and during the reporting period are summarized in **Table 7.1**.

**Table 7.1 Site Observations**

Date	Environmental Observations	Follow-up Status	Reminders
6 December 2022	Watering should be more frequently in dry season.(In MBR)	Water spraying was implemented regularly.	N.A.
	Chemical should be removed / placed on drip tray.(In MBR / SDB)	Chemical was removed.	N.A.
12 December 2022	Construction materials should not be put inside tree protection zone.	Construction materials was removed.	N.A.
	Sand bag should be place around gully to avoid seepage of muddy water.	Sand bag was provided surrounding the gully.	N.A.

Date	Environmental Observations	Follow-up Status	Reminders
20 December 2022	The cover of the pilling should be lower to avoid the covered the tree body.	A taller cover of the pilling was provided.	N.A.
	The water mitigation measure should be enhanced to avoid muddy water from flowing into storm drain.	Sand bag was provided.	N.A.
	Extensive pruning of tree T5 was observed.	Await report from Contractor.	N.A.
28 December 2022	Oil bottles should be put on drip tray.	Oil bottles were removed.	N.A.
	Sand bags should be placed to avoid muddy water or loose soil from flowing into the storm drain. Broken sand bags should be replaced.	Sand bag was provided surrounding the stom drain.	N.A.
	Stone breaker should be put on tarpaulin. Oil spillage should be soaked up and treated as chemical waste	Stone breaker was removed.	N.A.

7.3. According to the EIA Study Report, Environmental Permit, contract documents and EM&A Manual, the mitigation measures detailed in the documents should be implemented as much as practical during the reporting period. An updated Implementation Status of Environmental Mitigation Measures (EMIS) is provided in **Appendix G**.

#### 7.4.

### 8. CONCLUSION

8.1. This is the 17<sup>th</sup> Monthly EM&A Report for the Project which summarizes the key findings of the programme during the reporting period from 1 December to 31 December 2022, in accordance with the EM&A Manual and the requirement under EP-488/2014/A.

- 8.2. Five (5) sessions of air and four (4) sessions of noise monitoring were carried out at the monitoring locations sited at Cheung Chau in the reporting month.
- 8.3. Site audits were conducted as mitigation measures recommended for water pollution control and landscape and visual impact monitoring in the reporting period. Proper mitigation measures were implemented.
- 8.4. Weekly environmental site inspections were conducted during the reporting period. Only minor deficiencies were observed during site inspections. The environmental performance of the project was therefore considered satisfactory.
- 8.5. No exceedance of Action or Limit Level was recorded in the reporting period.
- 8.6. No environmental complaint was received in the reporting period.
- 8.7. No notification of summons or prosecution was received during the reporting period

## APPENDIX A

# Location Plan and Noise and Dust Monitoring Stations









# APPENDIX B

## Construction Programme

Contract No. DC/2019/07  
 Environmental Monitoring Works for  
 Upgrading of Cheung Chau Sewage Collection, Treatment and Disposal Facilities  
 17<sup>th</sup> EM&A Report – December 2022



Activity ID	Activity Name	Or. Dur (d)	TRA (d)	Time Elapsed %	Actual Workdone %	Actual Start	Actual Finish	Early Start	Early Finish	Late Start	Late Finish	Early Start (Rev.17)	Early Finish (Rev.17)	Amended Activities	Total Float	Gantt Chart (2021-2024)																																					
<b>OUTLYING ISLANDS SEWERAGE STAGE2 - UPGRADING OF CHEUNG CHAU SEWAGE TREATMEI</b>																30.19%	27-Nov-20	27-Nov-20 A	01-Jan-21	30-Sep-22	01-Jan-27	27-Nov-20	01-Jan-27	0	[Gantt Chart]																												
<b>KEY DATES</b>																100%	27-Nov-20	27-Nov-20 A	28-Dec-25	28-Dec-25	28-Dec-25	27-Nov-20	28-Dec-25	0	[Gantt Chart]																												
DC.KD.1010	Contract Starting Date	0	0	100%	100%	27-Nov-20		27-Nov-20 A				27-Nov-20			0	[Gantt Chart]																																					
DC.KD.1020	Contract Completion Date	0	0	0%	0%					28-Dec-25*	28-Dec-25	27-Nov-20	28-Dec-25		0	[Gantt Chart]																																					
<b>ACCESS DATES</b>																100%	27-Nov-20	03-Jun-21	27-Nov-20 A	03-Jun-21 A		27-Nov-20	03-Jun-21		[Gantt Chart]																												
DC.KD.1030	Portion A, B, C, D, E, F and Works Area WA1	0	0	100%	100%	27-Nov-20		27-Nov-20 A				27-Nov-20			0	[Gantt Chart]																																					
DC.KD.1030a	Works Area WA2	0	0	100%	100%	27-Nov-20		27-Nov-20 A				27-Nov-20			0	[Gantt Chart]																																					
DC.KD.1040	Works Area WA3	0	0	100%	100%	03-Jun-21		03-Jun-21 A				03-Jun-21			0	[Gantt Chart]																																					
<b>PLANNED COMPLETION DATES</b>																		29-May-21	29-May-21 A	10-Oct-25	22-Feb-23	10-Oct-25	29-May-21	02-Oct-25	0	[Gantt Chart]																											
DC.KD.1050	Planned Completion of Section 1 (Actual Commencement Date on 27 Nov 2020)	0	0				29-May-21			29-May-21 A					29-May-21	[Gantt Chart]																																					
DC.KD.1060	Planned Completion of Section 2 (Actual Commencement Date on 29 May 2021)	0	0							22-Feb-23*					22-Feb-23	[Gantt Chart]																																					
DC.KD.1070	Planned Completion of Section 3 (Actual Commencement Date on 29 May 2021)	0	0							13-Jan-25*					02-Apr-25	[Gantt Chart]																																					
DC.KD.1080	Planned Completion of Section 4 (Actual Commencement Date on 29 May 2021)	0	0							10-Oct-25*					02-Oct-25	[Gantt Chart]																																					
<b>CONTRACT SECTIONAL COMPLETION DATES</b>																		29-May-21	29-May-21 A	02-Jan-26	02-Dec-22	02-Jan-26	28-Feb-22	0	[Gantt Chart]																												
DC.KD.1230	Contract Sectional Completion Date of Section 1 (Actual Commencement Date on 27 Nov 2020)	0	0	100%			29-May-21			29-May-21 A					29-May-21	[Gantt Chart]																																					
DC.KD.1250	Contract Sectional Completion Date of Section 2 (Actual Commencement Date on 29 May 2021)	0	0	88.4%						03-Dec-22*					03-Dec-22	[Gantt Chart]																																					
DC.KD.1260	Contract Sectional Completion Date of Section 3 (Actual Commencement Date on 29 May 2021)	0	0	34.9%						02-Apr-25*					02-Apr-25	[Gantt Chart]																																					
DC.KD.1270	Contract Sectional Completion Date of Section 4 (Actual Commencement Date on 29 May 2021)	0	0	28.2%						02-Jan-26*					02-Jan-26	[Gantt Chart]																																					
<b>DESIGN SUBMISSION, PERMIT</b>																69.92%	27-Nov-20	27-Nov-20 A	02-Jul-25	14-Feb-24	10-Oct-25	27-Nov-20	19-Sep-25	100	[Gantt Chart]																												
DC.KD.1060	Prepare/submit of Temporary Drainage and Sewerage Management Plan to the Supervisor, DSD/MK&A	106	0	100%	100%	27-Nov-20	12-Mar-21	27-Nov-20 A	12-Mar-21 A			27-Nov-20	12-Mar-21			[Gantt Chart]																																					
DC.KD.1100	Consultation/Approval of Temporary Drainage and Sewerage Management Plan by the Supervisor, DSD/MK&A	60	0	100%	100%	13-Mar-21	11-May-21	13-Mar-21 A	11-May-21 A			13-Mar-21	11-May-21			[Gantt Chart]																																					
DC.KD.1110	Application/Approval of MDN & seeking Marine Dept's approval for loading/unloading at passage area near	170	0	100%	100%	27-Nov-20	15-May-21	27-Nov-20 A	15-May-21 A			27-Nov-20	15-May-21			[Gantt Chart]																																					
DC.KD.1120	Application/Approval of TMS and CNP for right works by relevant authorities	170	0	100%	100%	27-Nov-20	15-May-21	27-Nov-20 A	15-May-21 A			27-Nov-20	15-May-21			[Gantt Chart]																																					
DC.KD.1130	Application/Approval of permits or other statutory submissions by relevant authorities/parties	150	0	100%	100%	27-Nov-20	25-Apr-21	27-Nov-20 A	25-Apr-21 A			27-Nov-20	25-Apr-21			[Gantt Chart]																																					
DC.KD.1140	BIM Execution Plan	30	0	100%	100%	27-Nov-20	26-Dec-20	27-Nov-20 A	26-Dec-20 A			27-Nov-20	26-Dec-20			[Gantt Chart]																																					
DC.KD.1150	Preparation and submission of BIMs CoBe/Asset data deliverables	50	0	0%	0%			15-Mar-25	03-May-25	22-Aug-25	10-Oct-25	02-Jun-25	21-Jul-25		160	[Gantt Chart]																																					
DC.KD.1160	Preparation and submission of fully coordinated as-built BIM model	25	0	0%	0%			14-Apr-25	08-May-25	16-Sep-25	10-Oct-25	02-Jul-25	25-Jul-25		155	[Gantt Chart]																																					
DC.KD.1170	Preparation and submission of proposal of CoBe/Asset information requirements	200	0	0%	0%			15-Dec-24	02-Jul-25	25-Mar-25	10-Oct-25	04-Mar-25	19-Sep-25		100	[Gantt Chart]																																					
DC.KD.1180	Preparation and submission of Draft Safety Plan	14	0	100%	100%	27-Nov-20	10-Dec-20	27-Nov-20 A	10-Dec-20 A			27-Nov-20	10-Dec-20			[Gantt Chart]																																					
DC.KD.1190	Obtain comments on Draft Safety Plan	14	0	100%	100%	11-Dec-20	24-Dec-20	11-Dec-20 A	24-Dec-20 A			11-Dec-20	24-Dec-20			[Gantt Chart]																																					
DC.KD.1200	Preparation and Submission of Safety Plan	7	0	100%	100%	25-Dec-20	31-Dec-20	25-Dec-20 A	31-Dec-20 A			25-Dec-20	31-Dec-20			[Gantt Chart]																																					
DC.KD.1210	Preparation and Submission of Tree Survey Report	111	0	100%	100%	27-Nov-20	17-Mar-21	27-Nov-20 A	17-Mar-21 A			27-Nov-20	17-Mar-21			[Gantt Chart]																																					
DC.KD.1220	Obtain Discharge License by Client	1	0	0%	0%			14-Feb-24	14-Feb-24	14-Feb-24	14-Feb-24	07-Feb-24	07-Feb-24		0	[Gantt Chart]																																					
<b>SECTION 1</b>																100%	27-Nov-20	18-Nov-21	27-Nov-20 A	18-Nov-21 A		27-Nov-20	18-Nov-21		[Gantt Chart]																												
<b>TECHNICAL PROPOSAL for ECI Stage 2</b>																100%	27-Nov-20	18-Nov-21	27-Nov-20 A	18-Nov-21 A		27-Nov-20	18-Nov-21		[Gantt Chart]																												
<b>Technical Proposal for Preliminary Treatment System at CCSTW</b>																100%	03-Jun-21	18-Nov-21	03-Jun-21 A	18-Nov-21 A		03-Jun-21	18-Nov-21		[Gantt Chart]																												
DC.S1.1010	Preparation and approval of content page	10	0	100%	100%	03-Jun-21	12-Jun-21	03-Jun-21 A	12-Jun-21 A			03-Jun-21	12-Jun-21			[Gantt Chart]																																					
DC.S1.1020	Preparation of design report including design intention and list of design parameters / assumptions	25	0	100%	100%	13-Jun-21	07-Jul-21	13-Jun-21 A	07-Jul-21 A			13-Jun-21	07-Jul-21			[Gantt Chart]																																					
DC.S1.1030	Preparation of process calculation and equipment sizing	25	0	100%	100%	08-Jul-21	01-Aug-21	08-Jul-21 A	01-Aug-21 A			08-Jul-21	01-Aug-21			[Gantt Chart]																																					
DC.S1.1040	Preparation of general layout and equipment location plan	20	0	100%	100%	02-Aug-21	21-Aug-21	02-Aug-21 A	21-Aug-21 A			02-Aug-21	21-Aug-21			[Gantt Chart]																																					
DC.S1.1050	Preparation of control philosophy	9	0	100%	100%	22-Aug-21	30-Aug-21	22-Aug-21 A	30-Aug-21 A			22-Aug-21	30-Aug-21			[Gantt Chart]																																					
DC.S1.1060	Preparation of remaining content of technical proposal	19	0	100%	100%	31-Aug-21	18-Sep-21	31-Aug-21 A	18-Sep-21 A			31-Aug-21	18-Sep-21			[Gantt Chart]																																					
DC.S1.1070	Draft Submission	0	0	100%	100%			18-Sep-21	18-Sep-21 A			18-Sep-21	18-Sep-21			[Gantt Chart]																																					
DC.S1.1080	Draft Submission Comment and Approval	27	0	100%	100%	19-Sep-21	15-Oct-21	19-Sep-21 A	15-Oct-21 A			19-Sep-21	15-Oct-21			[Gantt Chart]																																					
DC.S1.1090	Final Submission	34	0	100%	100%	19-Oct-21	18-Nov-21	19-Oct-21 A	18-Nov-21 A			19-Oct-21	18-Nov-21			[Gantt Chart]																																					
<b>Technical Proposal for MBR System and MBR Building at CCSTW</b>																100%	27-Nov-20	25-May-21	27-Nov-20 A	25-May-21 A		27-Nov-20	25-May-21		[Gantt Chart]																												
<b>E&amp;M Submission</b>																100%	27-Nov-20	25-May-21	27-Nov-20 A	25-May-21 A		27-Nov-20	25-May-21		[Gantt Chart]																												
DC.S1.1110	Preparation and approval of content page	10	0	100%	100%	27-Nov-20	06-Dec-20	27-Nov-20 A	06-Dec-20 A			27-Nov-20	06-Dec-20			[Gantt Chart]																																					
DC.S1.1120	Preparation of design report including design intention and list of design parameters / assumptions	25	0	100%	100%	07-Dec-20	31-Dec-20	07-Dec-20 A	31-Dec-20 A			07-Dec-20	31-Dec-20			[Gantt Chart]																																					
DC.S1.1130	Preparation of process calculation and equipment sizing	25	0	100%	100%	01-Jan-21	25-Jan-21	01-Jan-21 A	25-Jan-21 A			01-Jan-21	25-Jan-21			[Gantt Chart]																																					
DC.S1.1140	Preparation of general layout and equipment location plan	20	0	100%	100%	26-Jan-21	14-Feb-21	26-Jan-21 A	14-Feb-21 A			26-Jan-21	14-Feb-21			[Gantt Chart]																																					
DC.S1.1150	Preparation of control philosophy	9	0	100%	100%	15-Feb-21	23-Feb-21	15-Feb-21 A	23-Feb-21 A			15-Feb-21	23-Feb-21			[Gantt Chart]																																					
DC.S1.1160	Preparation of remaining content of technical proposal	19	0	100%	100%	07-Mar-21	25-Mar-21	07-Mar-21 A	25-Mar-21 A			07-Mar-21	25-Mar-21			[Gantt Chart]																																					
DC.S1.1170	Draft Submission	0	0	100%	100%			25-Mar-21	25-Mar-21 A			25-Mar-21	25-Mar-21			[Gantt Chart]																																					
DC.S1.1180	Draft Submission Comment and Approval	27	0	100%	100%	26-Mar-21	21-Apr-21	26-Mar-21 A	21-Apr-21 A			26-Mar-21	21-Apr-21			[Gantt Chart]																																					
DC.S1.1190	Final Submission	34	0	100%	100%	22-Apr-21	25-May-21	22-Apr-21 A	25-May-21 A			22-Apr-21	25-May-21			[Gantt Chart]																																					
<b>Civil and Structural Submission</b>																100%	23-Dec-20	29-Apr-21	23-Dec-20 A	29-Apr-21 A		23-Dec-20	29-Apr-21		[Gantt Chart]																												
DC.S1.1680	Preparation of Design Report	54	0	100%	100%	23-Dec-20	14-Feb-21	23-Dec-20 A	14-Feb-21 A			23-Dec-20	14-Feb-21			[Gantt Chart]																																					
DC.S1.1690	Preparation of BIM Modelling	13	0	100%	100%	15-Feb-21	27-Feb-21	15-Feb-21 A	27-Feb-21 A			15-Feb-21	27-Feb-21			[Gantt Chart]																																					
DC.S1.1700	Submission of Draft Technical Proposal	0	0	100%	100%	28-Feb-21	28-Feb-21	28-Feb-21 A	28-Feb-21 A			28-Feb-21	28-Feb-21			[Gantt Chart]																																					
DC.S1.1710	Draft Submission Comment and Approval	27	0	100%	100%	28-Feb-21	26-Mar-21	28-Feb-21 A	26-Mar-21 A			28-Feb-21	26-Mar-21			[Gantt Chart]																																					
DC.S1.1720	Final Submission (With ICE Certificate)	34	0	100%	100%	27-Mar-21	29-Apr-21	27-Mar-21 A	29-Apr-21 A			27-Mar-21	29-Apr-21			[Gantt Chart]																																					
<b>Technical Proposal for Sludge Treatment System at CCSTW</b>																100%	27-Nov-20	25-May-21	27-Nov-20 A	25-May-21 A		27-Nov-20	25-May-21		[Gantt Chart]																												







Contract No. DC/2019/07  
 Environmental Monitoring Works for  
 Upgrading of Cheung Chau Sewage Collection, Treatment and Disposal Facilities  
 17<sup>th</sup> EM&A Report – December 2022



Activity ID	Activity Name	Est. Dur (d)	TRA (t)	Time Elapsed %	Actual Workdone %	Actual Start	Actual Finish	Early Start	Early Finish	Late Start	Late Finish	Early Start (Rev.17)	Early Finish (Rev.17)	Amended Activities	Total Float	2021	2022	2023	2024	2025	
DC.S2.1010a0	Procurement (VSD)	1	0	100%	100%	26-Jan-22	26-Jan-22	26-Jan-22 A	26-Jan-22 A			23-Jan-21	23-Jan-21								
DC.S2.1010a60	Procurement (Flowmeter)	126	0	100%	100%	26-Jan-22	27-Jan-22	26-Jan-22 A	27-Jan-22 A			25-Jan-22	26-Jan-22								
DC.S2.1010a60	Procurement (FRP Cover of Screw Pump)	1	0	100%	100%	30-May-22	30-May-22	30-May-22 A	30-May-22 A			30-May-22	30-May-22								
DC.S2.1010a70	Procurement (LVSB)	1	0	100%	100%	05-Mar-22	05-Mar-22	05-Mar-22 A	05-Mar-22 A			05-Mar-22	05-Mar-22								
DC.S2.1010b	Fabrication (Other equipment)	253	0	84.68%	80%	28-Feb-22		28-Feb-22 A	07-Nov-22	12-Oct-22	19-Nov-22	28-Feb-22	07-Nov-22		12						
DC.S2.1010b10	Fabrication (Screw Pumps)	253	0	100%	100%	12-Oct-21	28-Apr-22	12-Oct-21 A	28-Apr-22 A			12-Oct-21	28-Apr-22								
DC.S2.1010b20	Fabrication (Penstocks)	131	0	100%	100%	19-Mar-21	11-Jun-21	19-Mar-21 A	11-Jun-21 A			19-Mar-21	11-Jun-21								
DC.S2.1010b30	Fabrication (DOU)	142	0	100%	100%	30-May-22	28-Sep-22	30-May-22 A	28-Sep-22 A			30-May-22	28-Sep-22								
DC.S2.1010b40	Fabrication (VSD)	101	0	100%	100%	28-Feb-22	08-Jun-22	28-Feb-22 A	08-Jun-22 A			28-Feb-22	08-Jun-22								
DC.S2.1010b50	Fabrication (Flowmeter)	148	0	100%	100%	20-May-22	18-Sep-22	20-May-22 A	18-Sep-22 A			20-May-22	18-Sep-22								
DC.S2.1010b60	Fabrication (FRP Cover of Screw Pump)	131	0	93.13%	30%	31-May-22		31-May-22 A	08-Oct-22	18-Dec-22	26-Dec-22	31-May-22	08-Oct-22		79						
DC.S2.1010b70	Fabrication (LVSB)	90	0	100%	100%	10-May-22	07-Aug-22	10-May-22 A	07-Aug-22 A			10-May-22	07-Aug-22								
DC.S2.1010b80	Fabrication (PLC)	162	0	100%	100%	10-May-22	28-Sep-22	10-May-22 A	28-Sep-22 A			10-May-22	28-Sep-22								
DC.S2.1010c	Delivery (Other equipment)	30	0	0%	0%			08-Nov-22	07-Dec-22	20-Nov-22	19-Dec-22	08-Nov-22	07-Dec-22		12						
DC.S2.1010c10	Delivery (Screw Pump)	94	0	100%	100%	30-Apr-22	01-Aug-22	30-Apr-22 A	01-Aug-22 A			30-Apr-22	01-Aug-22								
DC.S2.1010c20	Delivery (Penstocks)	37	0	100%	100%	12-Jun-22	18-Jul-22	12-Jun-22 A	18-Jul-22 A			12-Jun-22	18-Jul-22								
DC.S2.1010c30	Delivery (DOU)	17	0	0%	0%			30-Sep-22	16-Oct-22	04-Dec-22	20-Dec-22	29-Sep-22	15-Oct-22		65						
DC.S2.1010c40	Delivery (VSD)	34	0	100%	100%	09-Jun-22	12-Jul-22	09-Jun-22 A	12-Jul-22 A			09-Jun-22	12-Jul-22								
DC.S2.1010c50	Delivery (Flowmeter)	30	0	0%	0%			30-Sep-22	29-Oct-22	20-Dec-22	18-Jan-23	19-Sep-22	18-Oct-22		81						
DC.S2.1010c60	Delivery (FRP Cover of Screw Pump)	37	0	0%	0%			09-Oct-22	14-Nov-22	27-Dec-22	01-Feb-23	09-Oct-22	14-Nov-22		79						
DC.S2.1010c70	Delivery (LVSB)	29	0	100%	100%	08-Aug-22	05-Sep-22	08-Aug-22 A	05-Sep-22 A			08-Aug-22	05-Sep-22								
DC.S2.1010c80	Delivery (PLC)	30	0	0%	0%			30-Sep-22	29-Oct-22	20-Oct-22	18-Nov-22	29-Sep-22	28-Oct-22		20						
<b>CIVIL AND STRUCTURAL WORKS</b>				<b>100%</b>		<b>27-Nov-20</b>	<b>13-Sep-22</b>					<b>27-Nov-20</b>	<b>13-Sep-22</b>								
<b>Modification of emergency by-pass</b>				<b>100%</b>		<b>27-Nov-20</b>	<b>13-Sep-22</b>	<b>27-Nov-20 A</b>	<b>13-Sep-22 A</b>			<b>27-Nov-20</b>	<b>13-Sep-22</b>								
DC.S2.1020	Expose and install or protect support system for existing underground utilities and services (HGC, CLP, etc)	28	2	100%	100%	29-Jun-21	03-Aug-21	29-Jun-21 A	03-Aug-21 A			29-Jun-21	03-Aug-21								
DC.S2.1021	Delivery of precast concrete pipe and manhole fittings	38	0	100%	100%	27-Nov-20	03-Jan-21	27-Nov-20 A	03-Jan-21 A			27-Nov-20	03-Jan-21								
DC.S2.1022	Samples testing for precast concrete pipe and manhole fittings	30	0	100%	100%	04-Jan-21	02-Feb-21	04-Jan-21 A	02-Feb-21 A			04-Jan-21	02-Feb-21								
DC.S2.1030	Installation of ELS for TTA Stage 1 and construction of 750 dia. emergency bypass and 3 manholes (BPMH)	80	10	100%	100%	04-Aug-21	19-Nov-21	04-Aug-21 A	19-Nov-21 A			04-Aug-21	19-Nov-21								
DC.S2.1031	Backfilling, Removal of Temporary Supports and Reinstatement of Footpath at Ping Chong Road	30	3	100%	100%	20-Nov-21	21-Dec-21	20-Nov-21 A	21-Dec-21 A			20-Nov-21	21-Dec-21								
DC.S2.1040	Implementation of TTA Stage 2 to enclose works area of manhole BPMH03	6	0	100%	100%	20-Nov-21	26-Nov-21	20-Nov-21 A	26-Nov-21 A			20-Nov-21	26-Nov-21								
DC.S2.1050	Installation of ELS and construction of 750 dia. emergency bypass for connection to manhole BPMH03	40	7	100%	100%	27-Nov-21	24-Jan-22	27-Nov-21 A	24-Jan-22 A			27-Nov-21	24-Jan-22								
DC.S2.1070	Backfilling, Removal of Temporary Supports and reinstatement of existing road at Ping Chong Road	28	2	100%	100%	25-Jan-22	03-Mar-22	25-Jan-22 A	03-Mar-22 A			25-Jan-22	03-Mar-22								
DC.S2.1080	Pipe CCTV survey, application manhole protective coat, capping and sealing of existing bypass and final cut	21	1	100%	100%	05-May-22	31-May-22	05-May-22 A	31-May-22 A			05-May-22	31-May-22								
DC.S2.1150	Submission of as-constructed records after completion of permanent reinstatement of the footpath	14	0	100%	100%	04-Mar-22	13-Sep-22	04-Mar-22 A	13-Sep-22 A			04-Mar-22	13-Sep-22								
DC.S2.1180	Submission of as-constructed point cloud records after laying of the 750mm diameter precast concrete pipes	14	0	100%	100%	04-Mar-22	13-Sep-22	04-Mar-22 A	13-Sep-22 A			04-Mar-22	13-Sep-22								
<b>E&amp;M WORKS</b>				<b>70.26%</b>		<b>20-Oct-21</b>	<b>20-Oct-21 A</b>	<b>22-Feb-23</b>	<b>30-Sep-22</b>	<b>22-Feb-23</b>	<b>20-Oct-21</b>	<b>22-Feb-23</b>			<b>0</b>						
DC.S2.1085a	Preparation and Submission of TTA Drawings for Pump Replacement Works	184	0	100%	100%	20-Oct-21	23-Apr-22	20-Oct-21 A	22-Apr-22 A			20-Oct-21	17-Jan-22								
DC.S2.1085b	Obtain Approval of TTA Drawing from relevant parties	30	0	100%	100%	29-Apr-22	28-May-22	29-Apr-22 A	28-May-22 A			29-Apr-22	28-May-22								
DC.S2.1085c	Implementation of TTA for Pump Replacement Works	1	0	100%	100%	24-Jun-22	04-Jul-22	24-Jun-22 A	04-Jul-22 A			24-Jun-22	24-Jun-22								
DC.S2.1090a	Removal of Existing Penstock No.3 and Screw Pump No. 3 and Civil Works for New Installation	23	0	100%	100%	19-Jul-22	13-Aug-22	19-Jul-22 A	13-Aug-22 A			19-Jul-22	13-Aug-22								
DC.S2.1090b	Installation of New Screw Pump No.3	21	0	100%	100%	18-Aug-22	12-Sep-22	18-Aug-22 A	12-Sep-22 A			18-Aug-22	12-Sep-22								
DC.S2.1090c	Screeding for the screw pump trough for Screw Pump No.3	11	0	100%	100%	13-Sep-22	26-Sep-22	13-Sep-22 A	26-Sep-22 A			13-Sep-22	21-Sep-22								
DC.S2.1090d	Preparation Works and Carry out Dry Test and Wet Test for Screw Pump No.3	8	0	12.5%	0%	29-Sep-22		29-Sep-22 A	06-Oct-22	30-Sep-22	06-Oct-22	29-Sep-22	06-Oct-22		0						
DC.S2.1090d10	Installation of New Penstock No.3 and Site Acceptance Test	14	0	100%	10%	13-Sep-22		13-Sep-22 A	30-Sep-22	06-Oct-22	06-Oct-22	13-Sep-22	28-Sep-22		4						
DC.S2.1091a	Removal of Existing Penstock No. 2 and Screw Pump No. 2 and Civil Works for New Installation	12	0	0%	0%	07-Oct-22		07-Oct-22 A	07-Oct-22	20-Oct-22	20-Oct-22	07-Oct-22	20-Oct-22								
DC.S2.1091b	Installation of New Screw Pump No.2	21	0	0%	0%	21-Oct-22		21-Oct-22 A	14-Nov-22	21-Oct-22	14-Nov-22	21-Oct-22	14-Nov-22		0						
DC.S2.1091c	Screeding for the screw pump trough for Screw Pump No.2	8	0	0%	0%	15-Nov-22		15-Nov-22 A	15-Nov-22	23-Nov-22	23-Nov-22	15-Nov-22	23-Nov-22		0						
DC.S2.1091d	Preparation Works and Carry out Dry Test and Wet Test for Screw Pump No.2	8	0	0%	0%	24-Nov-22		24-Nov-22 A	24-Nov-22	29-Nov-22	29-Nov-22	24-Nov-22	29-Nov-22		0						
DC.S2.1091d10	Installation of New Penstock No.2 and Site Acceptance Test	14	0	0%	0%	21-Oct-22		21-Oct-22 A	05-Nov-22	12-Nov-22	29-Nov-22	21-Oct-22	05-Nov-22		19						
DC.S2.1092a	Removal of Existing Penstock No.1 and Screw Pump No.1 and Civil Works for New Installation	12	0	0%	0%	30-Nov-22		30-Nov-22 A	30-Nov-22	13-Dec-22	13-Dec-22	30-Nov-22	13-Dec-22		0						
DC.S2.1092b	Installation of New Screw Pump No.1	21	0	0%	0%	14-Dec-22		14-Dec-22 A	09-Jan-23	14-Dec-22	09-Jan-23	14-Dec-22	09-Jan-23		0						
DC.S2.1092c	Screeding for the screw pump trough for Screw Pump No.1	6	0	0%	0%	10-Jan-23		10-Jan-23 A	16-Jan-23	10-Jan-23	16-Jan-23	10-Jan-23	16-Jan-23		0						
DC.S2.1092d	Preparation Works and Carry out Dry Test and Wet Test for Screw Pump No.1	7	0	0%	0%	17-Jan-23		17-Jan-23 A	23-Jan-23	17-Jan-23	23-Jan-23	17-Jan-23	23-Jan-23		0						
DC.S2.1092d10	Installation of New Penstock No.1 and Site Acceptance Test	14	0	0%	0%	14-Dec-22		14-Dec-22 A	05-Jan-23	21-Jan-23	21-Jan-23	14-Dec-22	30-Dec-22		18						
DC.S2.1100a	Removal of Existing Main Inlet Penstock and Civil Works for New Installation	14	0	21.43%	0%	27-Sep-22		27-Sep-22 A	14-Oct-22	22-Dec-22	05-Jan-23	27-Sep-22	14-Oct-22		68						
DC.S2.1100b	Replacement of Main Inlet Penstock with Site Acceptance Test & T & C	14	0	0%	0%	15-Oct-22		15-Oct-22 A	31-Oct-22	05-Jan-23	21-Jan-23	15-Oct-22	31-Oct-22		68						
DC.S2.1120	Replacement of the discharge EM flowmeter and modification of associated pipework	12	0	0%	0%	20-Oct-22		20-Oct-22 A	09-Jan-23	21-Jan-23	10-Oct-22	20-Oct-22	22-Oct-22		66						
DC.S2.1130	Installation of Dechlorination Unit 6 and associated FRP ductwork	24	2	0%	0%	08-Dec-22		08-Dec-22 A	09-Jan-23	21-Dec-22	21-Jan-23	08-Dec-22	09-Jan-23		11						
DC.S2.1140	Replacement of Existing Portable Emergency Generator Set by Mobile Emergency Generator Set	58	2	0%	0%	29-Oct-22		29-Oct-22 A	10-Jan-23	10-Nov-22	21-Jan-23	29-Oct-22	10-Jan-23		10						
DC.S2.1141	Replacement of Existing LV Switchboard by New LV Switchboard, PLC Panel and UPS	110	1	45.95%	46%	01-Aug-22		01-Aug-22 A	12-Dec-22	10-Nov-22	21-Jan-23	01-Aug-22	12-Dec-22		33						
DC.S2.1142	Installation of Screw Pump Starters and Variable Speed Drivers	110	1	60.36%	60%	13-Jul-22</															



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Activity ID	Activity Name	Or. Dur (d)	TRA (d)	Time Elapsed %	Actual Workdone %	Actual Start	Actual Finish	Early Start	Early Finish	Late Start	Late Finish	Early Start (Rev.17)	Early Finish (Rev.17)	Amended Activities	Total Float	2021	2022	2023	2024	2025	
DC.S3.1235b	Equipment Submission and Approval	435	0	95.63%	80%	10-Aug-21		10-Aug-21 A	18-Oct-22	05-Nov-22	26-Nov-22	10-Aug-21	18-Oct-22		39						
<b>Procurement</b>																					
DC.S3.1240a1	Sludge Digester Feed Pump and Digested Sludge Pump	1	0	100%	100%	31-Jan-22	31-Jan-22	31-Jan-22 A	31-Jan-22 A			10-Nov-21	10-Nov-21								
DC.S3.1240a10	Sludge Digester Air Blower	1	0	100%	100%	31-Jan-22	31-Jan-22	31-Jan-22 A	31-Jan-22 A			10-Nov-21	10-Nov-21								
DC.S3.1240a11	Air Diffuser for Sludge Digester	1	0	100%	100%	31-Jan-22	31-Jan-22	31-Jan-22 A	31-Jan-22 A			10-Nov-21	10-Nov-21								
DC.S3.1240a2	Submersible Mixer for Digested Sludge Holding Tank	1	0	100%	100%	31-Jan-22	31-Jan-22	31-Jan-22 A	31-Jan-22 A			10-Nov-21	10-Nov-21								
DC.S3.1240a3	Deoxygenation Unit 4	1	0	100%	100%	31-Jan-22	31-Jan-22	31-Jan-22 A	31-Jan-22 A			10-Nov-21	10-Nov-21								
DC.S3.1240a4	LV Switchboards, Motor Control Centers and Associated Components	1	0	100%	100%	31-Jan-22	31-Jan-22	31-Jan-22 A	31-Jan-22 A			10-Nov-21	10-Nov-21								
DC.S3.1240a5	Variable Speed Drive (VSD)	1	0	100%	100%	31-Jan-22	31-Jan-22	31-Jan-22 A	31-Jan-22 A			10-Nov-21	10-Nov-21								
DC.S3.1240a6	Cable	1	0	100%	100%	31-Jan-22	31-Jan-22	31-Jan-22 A	31-Jan-22 A			10-Nov-21	10-Nov-21								
DC.S3.1240a7	Pipe Work/Valve	1	0	100%	100%	31-Jan-22	31-Jan-22	31-Jan-22 A	31-Jan-22 A			10-Nov-21	10-Nov-21								
DC.S3.1240a8	Instrument	1	0	100%	100%	31-Jan-22	31-Jan-22	31-Jan-22 A	31-Jan-22 A			10-Nov-21	10-Nov-21								
DC.S3.1240a9	Lifting Appliance	1	0	100%	100%	31-Jan-22	31-Jan-22	31-Jan-22 A	31-Jan-22 A			10-Nov-21	10-Nov-21								
<b>Fabrication</b>																					
DC.S3.1240b1	Sludge Digester Feed Pump and Digested Sludge Pump	240	0	100%	100%	01-Feb-22	28-Sep-22	01-Feb-22 A	26-Nov-22	26-Dec-22	26-Feb-23	01-Feb-22	15-Jan-23		92						
DC.S3.1240b10	Sludge Digester Air Blower	169	0	100%	100%	01-Feb-22	20-Jul-22	01-Feb-22 A	20-Jul-22 A			31-Jul-22	15-Jan-23								
DC.S3.1240b11	Air Diffuser for Sludge Digester	240	0	100%	100%	01-Feb-22	28-Sep-22	01-Feb-22 A	28-Sep-22 A			01-Feb-22	28-Sep-22								
DC.S3.1240b2	Submersible Mixer for Digested Sludge Holding Tank	164	0	100%	100%	01-Feb-22	15-Jul-22	01-Feb-22 A	15-Jul-22 A			01-Feb-22	14-Jul-22								
DC.S3.1240b3	Deoxygenation Unit 4	299	0	80.6%	40%	01-Feb-22		01-Feb-22 A	26-Nov-22	26-Dec-22	21-Feb-23	01-Feb-22	26-Nov-22		87						
DC.S3.1240b4	LV Switchboards, Motor Control Centers and Associated Components	239	0	100%	100%	01-Feb-22	27-Sep-22	01-Feb-22 A	27-Sep-22 A			01-Feb-22	27-Sep-22								
DC.S3.1240b5	Variable Speed Drive (VSD)	180	0	100%	100%	01-Feb-22	30-Jul-22	01-Feb-22 A	30-Jul-22 A			01-Feb-22	30-Jul-22								
DC.S3.1240b6	Cable	240	0	100%	100%	01-Feb-22	28-Sep-22	01-Feb-22 A	28-Sep-22 A			01-Feb-22	28-Sep-22								
DC.S3.1240b7	Pipe Work/Valve	243	0	99.18%	75%	01-Feb-22		01-Feb-22 A	01-Oct-22	25-Feb-23	26-Feb-23	01-Feb-22	01-Oct-22		148						
DC.S3.1240b8	Instrument	243	0	99.18%	40%	01-Feb-22		01-Feb-22 A	01-Oct-22	25-Feb-23	26-Feb-23	01-Feb-22	01-Oct-22		148						
DC.S3.1240b9	Lifting Appliance	243	0	99.18%	40%	01-Feb-22		01-Feb-22 A	01-Oct-22	25-Feb-23	26-Feb-23	01-Feb-22	01-Oct-22		148						
<b>Delivery</b>																					
DC.S3.1240c1	Sludge Digester Feed Pump and Digested Sludge Pump	33	0	3.03%	0%	29-Sep-22		29-Sep-22 A	31-Oct-22	27-Mar-23	27-Apr-23	29-Sep-22	31-Oct-22		178						
DC.S3.1240c10	Sludge Digester Air Blower	26	0	100%	100%	01-Aug-22	26-Aug-22	01-Aug-22 A	26-Aug-22 A			01-Aug-22	26-Aug-22								
DC.S3.1240c11	Air Diffuser for Sludge Digester	47	0	2.13%	0%	29-Sep-22		29-Sep-22 A	14-Nov-22	09-Apr-23	24-May-23	29-Sep-22	14-Nov-22		191						
DC.S3.1240c2	Submersible Mixer for Digested Sludge Holding Tank	60	0	100%	100%	31-Jul-22	28-Sep-22	31-Jul-22 A	28-Sep-22 A			31-Jul-22	28-Sep-22								
DC.S3.1240c3	Deoxygenation Unit 4	65	0	0%	0%			27-Nov-22	30-Jan-23	22-Feb-23	27-Apr-23	27-Nov-22	30-Jan-23		87						
DC.S3.1240c4	LV Switchboards, Motor Control Centers and Associated Components	66	0	3.57%	0%	28-Sep-22		28-Sep-22 A	22-Nov-22	15-Mar-23	07-May-23	28-Sep-22	22-Nov-22		166						
DC.S3.1240c5	Variable Speed Drive (VSD)	44	0	100%	100%	24-May-22	07-Jul-22	24-May-22 A	07-Jul-22 A			24-May-22	07-Jul-22								
DC.S3.1240c6	Cable	60	0	18.03%	20%	19-Sep-22		19-Sep-22 A	18-Nov-22	02-Mar-23	20-Apr-23	29-Sep-22	27-Nov-22		153						
DC.S3.1240c7	Pipe Work/Valve	60	0	0%	0%			02-Oct-22	30-Nov-22	27-Feb-23	27-Apr-23	02-Oct-22	30-Nov-22		148						
DC.S3.1240c8	Instrument	60	0	0%	0%			02-Oct-22	30-Nov-22	27-Feb-23	27-Apr-23	02-Oct-22	30-Nov-22		148						
DC.S3.1240c9	Lifting Appliance	60	0	0%	0%			02-Oct-22	30-Nov-22	27-Feb-23	27-Apr-23	02-Oct-22	30-Nov-22		148						
<b>Civil &amp; Structural Works</b>																					
DC.S3.1250	Site Preparation Works for Piling (including removal of existing Sludge Tank)	35	4	100%	100%	31-May-21	17-Jul-21	31-May-21 A	17-Jul-21 A			31-May-21	17-Jul-21								
DC.S3.1280a	Subletting of Supply and Installation of ELS	29	0	100%	100%	01-Aug-21	29-Aug-21	01-Aug-21 A	29-Aug-21 A			01-Aug-21	29-Aug-21								
DC.S3.1280c10	Preliminary Pile and Pile Load Test	45	3	100%	100%	12-Jul-21	06-Sep-21	12-Jul-21 A	06-Sep-21 A			03-Dec-21	04-Feb-22								
DC.S3.1280b	Piling works for pre-bored socket H-piles (37 nos, dia610, 11team)	79	4	100%	100%	23-Jul-21	01-Nov-21	23-Jul-21 A	01-Nov-21 A			15-Dec-21	28-Mar-22								
DC.S3.1280a	Pre-boring for installation of sheet piles	122	1	100%	100%	01-Nov-21	31-Mar-22	01-Nov-21 A	31-Mar-22 A			01-Nov-21	30-Mar-22								
DC.S3.1280b	Installation of sheet piles (FSPV1)	25	2	100%	100%	01-Apr-22	10-May-22	01-Apr-22 A	10-May-22 A			01-Apr-22	07-May-22								
DC.S3.1300	Excavation for basement of Sludge Digester Building (3425m3 exca, 1 team)	109	2	100%	100%	10-May-22	22-Sep-22	10-May-22 A	22-Sep-22 A			10-May-22	19-Sep-22								
DC.S3.1310a	Subletting of Rebar Fixing	45	0	100%	100%	25-Nov-21	19-Jan-22	25-Nov-21 A	19-Jan-22 A			25-Nov-21	19-Jan-22								
DC.S3.1310b	Subletting of Formworks, Concretor and Miscellaneous Works	45	0	100%	100%	25-Nov-21	19-Jan-22	25-Nov-21 A	19-Jan-22 A			25-Nov-21	19-Jan-22								
DC.S3.1310c	Construction of RC substructures of sludge digester building (Grid 2-4)	57	2	15.25%	5%	23-Sep-22		23-Sep-22 A	30-Nov-22	07-Dec-22	07-Feb-23	20-Sep-22	30-Nov-22		55						
DC.S3.1320	Backfilling to ground level and removal of ELS (Grid 2-4)	5	1	0%	0%			01-Dec-22	07-Dec-22	08-Feb-23	14-Feb-23	01-Dec-22	07-Dec-22		55						
DC.S3.1330	Installation of ELS and excavation for pile cap of Sludge Holding Tanks (523m3 exca, 1 team)	9	1	0%	0%			08-Nov-22	18-Nov-22	14-Jan-23	27-Jan-23	08-Nov-22	18-Nov-22		55						
DC.S3.1340	Construction of RC structure of Sludge Holding Tanks (below ground, 226m3)	22	2	0%	0%			19-Nov-22	17-Dec-22	28-Jan-23	04-Mar-23	19-Nov-22	17-Dec-22		55						
DC.S3.1350	Backfilling to ground level and removal of ELS (Sludge Holding Tank)	5	1	0%	0%			19-Dec-22	24-Dec-22	25-Feb-23	03-Mar-23	19-Dec-22	24-Dec-22		55						
DC.S3.1361	Construction of RC superstructure (Sludge Holding Tank)	35	2	0%	0%			27-Dec-22	10-Feb-23	04-Mar-23	20-Apr-23	27-Dec-22	10-Feb-23		55						
DC.S3.1360	Construction of RC Structure (Guide 1-4) (above ground, 856m3)	35	2	0%	0%			27-Dec-22	10-Feb-23	04-Mar-23	20-Apr-23	27-Dec-22	10-Feb-23		55						
DC.S3.1390	Installation of ELS and excavation for substructures of Sludge Digester Building (Guide 1-2) (523m3 exca, 1 team)	9	1	0%	0%			08-Nov-22	18-Nov-22	14-Jan-23	27-Jan-23	08-Nov-22	18-Nov-22		55						
DC.S3.1400	Construction of RC substructure of sludge digester building (Grid 1-2)	22	2	0%	0%			19-Nov-22	17-Dec-22	28-Jan-23	24-Feb-23	19-Nov-22	17-Dec-22		55						
DC.S3.1410	Backfilling to ground level and removal of ELS (Grid 1-2)	5	1	0%	0%			19-Dec-22	24-Dec-22	25-Feb-23	03-Mar-23	19-Dec-22	24-Dec-22		55						
<b>B&amp;M Works</b>																					
DC.S3.1380a	Installation of Submersible Mixer, Air Blower, Air Diffuser, Feed Pump, DOU	56	0	0%	0%			11-Feb-23	07-Jun-23	21-Apr-23	28-Jul-23	11-Feb-23	22-Jun-23		51						
DC.S3.1380b	Installation of Cable Containment & Conduit	25	0	0%	0%			11-Feb-23	11-Mar-23	21-Apr-23	20-May-23	11-Feb-23	11-Mar-23		55						
DC.S3.1380c	Installation of BS Equipment, Cable, Instrument, PLC Panel	43	0	0%	0%			27-Feb-23	21-Apr-23	08-May-23	28-Jun-23	27-Feb-23	21-Apr-23		55						
DC.S3.1390a	SCADA System Site Acceptance Test (Phase 1 Sludge Digester Building Construction)	30	0	0%	0%			29-Mar-23	27-Apr-23	30-May-23	28-Jun-23	29-Mar-23	27-Apr-23		62						
DC.S3.1390b	SCADA System Commissioning Test (Phase 1 Sludge Digester Building Construction)	30	0	0%	0%			28-Apr-23	27-May-23	29-Jun-23	28-Jul-23	28-Apr-23	27-May-23		62						
DC.S3.1400b	System Commissioning Test (Interim Testing)	30	0	0%	0%			09-May-23	27-Jun-23	23-Jun-23	28-Jul-23	09-May-23	22-Jun-23		51						







Contract No. DC/2019/07  
 Environmental Monitoring Works for  
 Upgrading of Cheung Chau Sewage Collection, Treatment and Disposal Facilities  
 17th EM&A Report – December 2022



Activity ID	Activity Name	Est. Dur (d)	TRA (d)	Time Elapsed %	Actual Workdone %	Actual Start	Actual Finish	Early Start	Early Finish	Late Start	Late Finish	Early Start (Rev.17)	Early Finish (Rev.17)	Amended Activities	Total Float	2021	2022	2023	2024	2025	
<b>E&amp;M Works - 30-month performance verification (At least 9 months before End of S3)</b>																					
DC.S3.3180	30-month performance verification (At least 9 months before End of S3) (Period from 0th to 9th month)	270	0	0%	0%			18-Apr-24	12-Jan-25	06-Jul-24	01-Apr-25	11-Apr-24	05-Jan-25		79						
<b>Construction of Underground Utilities</b>																					
DC.S3.3250	Construction underground utilities for MBR Treatment Facilities and Preliminary Treatment Facilities	38	2	0%	0%			17-Jan-24	05-Mar-24	26-Jan-24	15-Mar-24	10-Jan-24	28-Feb-24		8						
<b>PHASE 4 - Demolition of existing Preliminary Treatment System</b>																					
DC.S3.4010	Demolition of existing inlet pumping station, preliminary treatment facilities & primary sediment tank	40	3	0%	0%			18-Apr-24	02-Jul-24	18-Apr-24	31-Jul-24	11-Apr-24	25-Jun-24		29						
DC.S3.4020	Modification of Inlet Chamber	56	4	0%	0%			18-Apr-24	08-Jun-24	18-Apr-24	08-Jun-24	11-Apr-24	01-Jun-24		25						
DC.S3.4030	Demolition of existing Transformer House	38	3	0%	0%			18-Apr-24	07-Jun-24	29-Apr-24	19-Jun-24	11-Apr-24	31-May-24		9						
DC.S3.4031	Ground Investigation (7 nos. 1 rig, 1 team)	22	2	0%	0%			11-May-24	08-Jun-24	11-May-24	08-Jun-24	04-May-24	01-Jun-24		0						
DC.S3.4040	Disconnecting data link of removed existing equipment from the existing SCADA system (Phase 4 Demolitor)	4	3	0%	0%			29-Jun-24	02-Jul-24	25-Jul-24	31-Jul-24	19-Jun-24	25-Jun-24		29						
<b>PHASE 5 - Construction of Remaining Buildings</b>																					
<b>Construction of WAS Storage Tank of Sludge Centrifuge House</b>																					
<b>Civil &amp; Structural Works</b>																					
DC.S3.3190	Piling works for pre-bored socket H-piles (14 nos, dia 610 x 14m, 1 team)	26	4	0%	0%			18-Jul-23	21-Aug-23	05-Sep-23	11-Oct-23	01-Aug-23	04-Sep-23		42						
DC.S3.3200	Installation of sheet piles and Proof Drill	56	4	0%	0%			22-Aug-23	02-Nov-23	12-Oct-23	21-Dec-23	06-Sep-23	16-Nov-23		42						
DC.S3.3201	Pile Loading Test of Tension Pile	6	1	0%	0%			03-Nov-23	10-Nov-23	22-Dec-23	02-Jan-24	17-Nov-23	24-Nov-23		42						
DC.S3.3210	Excavation and installation of ELS for WAS Storage Tank	84	6	0%	0%			11-Nov-23	01-Mar-24	03-Jan-24	24-Apr-24	25-Nov-23	15-Mar-24		42						
DC.S3.3220	Construction of RC Structure (below ground)	84	6	0%	0%			02-Mar-24	22-Jun-24	25-Apr-24	12-Aug-24	16-Mar-24	09-Jul-24		42						
DC.S3.3230	Removal of formworks, falseworks; application of waterproofing, backfilling and removal of ELS	12	2	0%	0%			24-Jun-24	10-Jul-24	19-Aug-24	03-Sep-24	08-Jul-24	24-Jul-24		47						
DC.S3.3240	Construction of RC Structure (above ground)	54	6	0%	0%			11-Jul-24	19-Sep-24	04-Sep-24	15-Nov-24	25-Jul-24	04-Oct-24		47						
<b>Construction of Effluent Reuse Building</b>																					
<b>Procurement, Fabrication and Delivery of Major E&amp;M Equipment</b>																					
DC.S3.5125a	Tendering of Subcontractor	45	0	100%	100%	12-Jul-21	25-Aug-21	12-Jul-21 A	29-Aug-24	17-Nov-22	19-Oct-24	12-Jul-21	29-Aug-24		49						
DC.S3.5125b	Equipment Submission and Approval	650	0	61.54%	30%	25-Aug-21		26-Aug-21 A	06-Jun-23	17-Nov-22	24-Jul-23	26-Aug-21	06-Jun-23		49						
DC.S3.5130a	Procurement	90	0	0%	0%			07-Jun-23	04-Sep-23	25-Jul-23	22-Oct-23	07-Jun-23	04-Sep-23		49						
DC.S3.5130b	Fabrication	240	0	0%	0%			05-Sep-23	01-May-24	23-Oct-23	18-Jun-24	05-Sep-23	01-May-24		49						
DC.S3.5130c	Delivery	120	0	0%	0%			02-May-24	29-Aug-24	19-Jun-24	19-Oct-24	02-May-24	29-Aug-24		49						
<b>Civil &amp; Structural Works</b>																					
DC.S3.5140a	Installation of pipe pile wall of ELS (65 nos, dia 323 x 8m, 1 team)	12	8	0%	0%			11-Jun-24	05-Oct-24	19-Jul-24	13-Nov-24	03-Jun-24	27-Sep-24		32						
DC.S3.5140b	Proof Drill	7	5	0%	0%			05-Jul-24	16-Jul-24	12-Aug-24	24-Aug-24	27-Jun-24	11-Jul-24		32						
DC.S3.5150	Grout Curtain Works	11	1	0%	0%			05-Jul-24	16-Jul-24	12-Aug-24	24-Aug-24	27-Jun-24	11-Jul-24		32						
DC.S3.5160	Installation of ELS and Excavation for basement (970m3 exca, 1team)	11	1	0%	0%			19-Jul-24	01-Aug-24	25-Aug-24	07-Sep-24	12-Jul-24	25-Jul-24		32						
DC.S3.5170	Construction of RC structure (below ground, 437m3)	22	2	0%	0%			02-Aug-24	29-Aug-24	09-Sep-24	09-Oct-24	26-Jul-24	22-Aug-24		32						
DC.S3.5180	Removal of formworks, falseworks; application of waterproofing, backfilling and removal of ELS	5	1	0%	0%			30-Aug-24	05-Sep-24	09-Oct-24	19-Oct-24	23-Aug-24	29-Aug-24		32						
DC.S3.5190	Construction of RC Structure (above ground, 213m3)	22	2	0%	0%			08-Sep-24	05-Oct-24	17-Oct-24	13-Nov-24	30-Aug-24	27-Sep-24		32						
<b>E&amp;M Works</b>																					
DC.S3.5210	E&M LVS& BS Installation (UV system, Chemical tanks and dosing system and etc.)	67	5	0%	0%			05-Sep-24	18-Feb-25	17-Oct-24	27-Mar-25	30-Aug-24	11-Feb-25		37						
DC.S3.5220a	SCADA System Site Acceptance Test (Phase 5 Effluent Reuse Construction)	60	0	0%	0%			22-Oct-24	20-Dec-24	28-Nov-24	26-Jan-25	15-Oct-24	13-Dec-24		37						
DC.S3.5220b	SCADA System Commissioning Test (Phase 5 Effluent Reuse Construction)	60	0	0%	0%			21-Dec-24	18-Feb-25	27-Jan-25	27-Mar-25	14-Dec-24	11-Feb-25		37						
DC.S3.5230a	System Commissioning Test (Inflow Testing)	60	0	0%	0%			21-Dec-24	18-Feb-25	27-Jan-25	27-Mar-25	14-Dec-24	11-Feb-25		37						
<b>Internal Architectural Works</b>																					
DC.S3.5200	Architectural Works (Internal)	84	6	0%	0%			07-Oct-24	23-Jan-25	06-Dec-24	27-Mar-25	28-Sep-24	16-Jan-25		51						
<b>Construction of Sludge Centrifuge Building &amp; Genset and Fuel Tank Rooms</b>																					
<b>Procurement, Fabrication and Delivery of Major E&amp;M Equipment</b>																					
DC.S3.5005a	Tendering of Subcontractor	45	0	100%	100%	12-Jul-21	25-Aug-21	12-Jul-21 A	25-Aug-21 A			12-Jul-21	25-Aug-21		89						
DC.S3.5005b	Equipment Submission and Approval	860	0	60.61%	30%	25-Aug-21		26-Aug-21 A	16-Jun-23	07-Dec-22	23-Aug-23	26-Aug-21	16-Jun-23		89						
DC.S3.5010a	Procurement	45	0	0%	0%			17-Jun-23	31-Jul-23	24-Aug-23	07-Oct-23	17-Jun-23	31-Jul-23		68						
DC.S3.5010b	Fabrication	225	0	0%	0%			01-Aug-23	12-Mar-24	08-Oct-23	19-May-24	01-Aug-23	12-Mar-24		68						
DC.S3.5010c	Delivery	180	0	0%	0%			13-Mar-24	08-Sep-24	20-May-24	15-Nov-24	13-Mar-24	08-Sep-24		68						
<b>Civil &amp; Structural Works</b>																					
DC.S3.5020a	Piling works for pre-bored socket H-piles (24 nos, dia 610 x 15m, 1team)	23	4	0%	0%			03-Jun-24	05-Jul-24	03-Jun-24	05-Jul-24	03-Jun-24	05-Jul-24		0						
DC.S3.5030	Installation of pipe pile wall of ELS (80 nos, dia 323 x 6m, 1 teams)	18	6	0%	0%			24-Jun-24	22-Jul-24	24-Jun-24	22-Jul-24	24-Jun-24	22-Jul-24		0						
DC.S3.5040	Grout Curtain Works	16	2	0%	0%			23-Jul-24	12-Aug-24	23-Jul-24	12-Aug-24	23-Jul-24	12-Aug-24		0						
DC.S3.5050	Excavation for pumping tank (130m3 exca, 1team)	11	1	0%	0%			13-Aug-24	26-Aug-24	13-Aug-24	26-Aug-24	13-Aug-24	26-Aug-24		0						
DC.S3.5060	Construction of RC structure (below ground, 887m3)	2	2	0%	0%			27-Aug-24	24-Sep-24	27-Aug-24	24-Sep-24	27-Aug-24	24-Sep-24		0						
DC.S3.5070	Removal of formworks, falseworks; application of waterproofing, backfilling and removal of ELS	5	2	0%	0%			25-Sep-24	03-Oct-24	25-Sep-24	03-Oct-24	25-Sep-24	03-Oct-24		0						
DC.S3.5080	Construction of RC Structure (above ground, 1310m3)	34	2	0%	0%			04-Oct-24	15-Nov-24	04-Oct-24	15-Nov-24	04-Oct-24	15-Nov-24		0						
<b>E&amp;M Works</b>																					
DC.S3.5100	E&M LVS& BS Installation (centrifuges and its auxiliary equipment and Polymer preparation system)	56	5	0%	0%			16-Nov-24	02-Apr-25	16-Nov-24	02-Apr-25	16-Nov-24	02-Apr-25		0						
DC.S3.5110a	SCADA System Site Acceptance Test (Phase 5 Sludge Centrifuge Construction)	30	0	0%	0%			16-Nov-24	15-Dec-24	03-Jan-25	01-Feb-25	16-Nov-24	15-Dec-24		48						
DC.S3.5110b	SCADA System Commissioning Test (Phase 5 Sludge Centrifuge Construction)	30	0	0%	0%			16-Dec-24	14-Jan-25	02-Feb-25	03-Mar-25	16-Dec-24	14-Jan-25		48						
DC.S3.5120a	System Commissioning Test (Inflow Testing)	30	0	0%	0%			02-Feb-25	03-Mar-25	02-Feb-25	03-Mar-25	02-Feb-25	03-Mar-25		0						
DC.S3.5120c	Final System Commissioning Test	30	0	0%	0%			04-Mar-25	02-Apr-25	04-Mar-25	02-Apr-25	04-Mar-25	02-Apr-25		0						
<b>Internal Architectural Works</b>																					
DC.S3.5090	Architectural Works (Internal)	84	6	0%	0%			16-Nov-24	07-Mar-25	12-Dec-24	02-Apr-25	16-Nov-24	07-Mar-25		22						









# APPENDIX C

## Calibration Certificates

### (Air Monitoring)



Website: www.acuityhk.com  
 Unit E, 12/F, Ford Gloey Plaza  
 Nos. 37-39 Wing Hong Street,  
 Cheung Sha Wan, Kowloon.  
 Tel.: (852) 2696 6833  
 Fax: (852) 2698 9383

## Sibata LD-5R K-Factor Verification Test by Total Suspended Particulates HVS Test Report

Verification Test Date: 27-Mar-22 to 3-Apr-22  
 Next Verification Test Date: 4-Apr-23  
 Unit-under-Test- Model No. Sibata LD-5R  
 Unit-under-Test Serial No. 761173  
 Our Report Reference No. RPT-22-HVS-0011

Standard Equipment Information		
Verification Equipment Type	Tisch' s	Tish HVS
Standard Equipment Model No.	TE-5170X	TE-5025A
Equipment serial no.	MFC 1049	3465
Last Calibration Date	2-Jun-22	28-Jun-22
Next Calibration Date	1-Sep-22	29-Jun-23

Verification Test No.	Date	Time			K-Factor (K=C/R)	Counts/ Minute (R)	Total Counts (TC)	TSP Sample ID No.	Dust Concentration (ug/m3), (C)	
		Start-time	End-time	Elapsed Time (in min)					x-axis	y axis
1	10/7/2022	5653.00	5656.00	180.00	0.00012	50	9000	R221113/1	6	
2	10/7/2022	5656.00	5659.00	180.00	0.00033	58	7980	R221113/2	15	
3	10/7/2022	5659.00	5663.00	240.00	0.00008	44	13920	R221113/3	5	
4	17/7/2022	5715.00	5719.00	240.00	0.00050	67	15200	R221114/1	32	
5	17/7/2022	5719.00	5722.00	180.00	0.00047	63	11820	R221114/2	31	
6	17/7/2022	5722.00	5725.00	180.00	0.00051	66	12000	R221114/3	34	

K-Factor to be inputted in LD-5R (corrected 1 decimal point): **0.3**


By Linear Regression of y on x:

slope, mh= 1.4270  
 intercept, ch= -62.5718

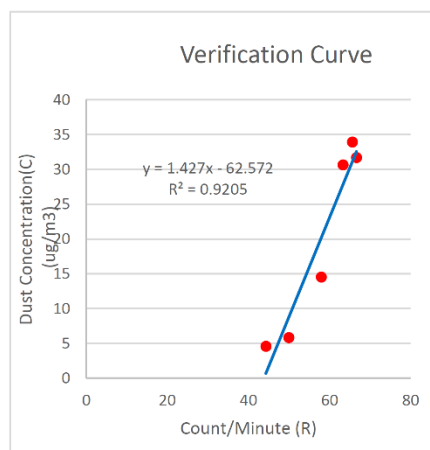
\*Correlation Coefficient, R= 0.9594

Verification Test Result: Strong Correlation. Results were accepted.

\* If the Correlation Coefficient, R is <0.5. Checking and Re-verification are required.

Verified By:   
 Field Supervisor

Date: 16-08-2022







Website: [www.acuityhk.com](http://www.acuityhk.com)  
 Unit C, 11/F, Ford Glory Plaza,  
 Nos. 57-59 Wing Hong Street,  
 Cheung Sha Wan, Kowloon.  
 Tel.: (852) 2698 6835  
 Fax.: (852) 2698 9585

### Sibata LD-5R K-Factor Verification Test by Total Suspended Particulates HVS Test Report

Verification Test Date: 9-Oct-22 to 16-Oct-22  
 Next Verification Test Date: 17-Oct-23  
 Unit-under-Test- Model No. Sibata LD-5R  
 Unit-under-Test Serial No. 992821  
 Our Report Reference No. RPT-22-HVS-0013

Standard Equipment Information		
Verification Equipment Type	Tisch' s	Tish HVS
	TSP HVS	Calibrator
Standard Equipment Model No.	TE-5170X	TE-5025A
Equipment serial no.	MFC 1049	3465
Last Calibration Date	28-Sep-22	28-Jun-22
Next Calibration Date	28-Nov-22	29-Jun-23

Verification Test No.	Date	Time			K-Factor	Counts/Minute (R)	Total Counts (TC)	TSP Sample ID No.	Dust Concentration (ug/m3), (C)
		Start-time	End-time	Elapsed Time (in min)					K-Factor (K=C/R)
1	9/10/2022	6210.34	6213.34	180.00	0.00072	47.67	8580	R221670/1	34
2	9/10/2022	6213.34	6216.36	181.20	0.00093	71.00	12865	R221670/2	66
3	9/10/2022	6216.36	6221.78	325.20	0.00115	89.33	29051	R221670/3	103
4	16/10/2022	6249.91	6252.92	180.60	0.00108	50.00	9030	R221671/1	54
5	16/10/2022	6252.92	6255.92	180.00	0.00110	80.33	14460	R221671/2	88
6	16/10/2022	6255.92	6261.94	361.20	0.00109	75.67	27331	R221671/3	83
					0.00101				

K-Factor to be inputted in LD-5R (corrected 1 decimal point): 1.0

By Linear Regression of y on x:

slope, mh= 1.4403

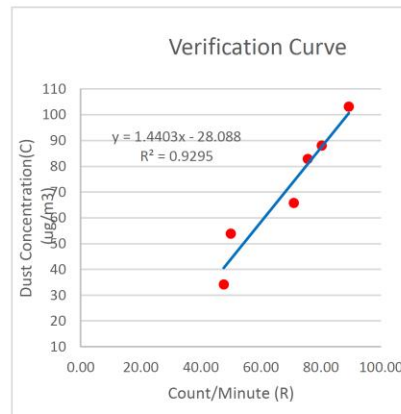
intercept, ch= -28.0877

\*Correlation Coefficient, R= 0.9641

Verification Test Result: Strong Correlation. Results were accepted.

\* If the Correlation Coefficient, R is <0.5. Checking and Re-verification are required.

Verified By: [Signature] Date: 19-10-2022  
 Technical Manager





Website: www.acuityhk.com  
 Unit C, 11/F, Ford Glory Plaza,  
 Nos. 57-59 Wing Hong Street,  
 Cheung Sha Wan, Kowloon.  
 Tel.: (852) 2698 6855  
 Fax.: (852) 2698 9563

### Sibata LD-5R K-Factor Verification Test by Total Suspended Particulates HVS Test Report

Verification Test Date: 9-Oct-22 to 16-Oct-22  
 Next Verification Test Date: 17-Oct-23  
 Unit-under-Test- Model No. Sibata LD-5R  
 Unit-under-Test Serial No. 851820  
 Our Report Reference No. RPT-22-HVS-0019

Standard Equipment Information			
Verification Equipment Type	Tisch' s	Tish HVS	
	TSP HVS	Calibrator	
Standard Equipment Model No.	TE-5170X	TB-5025A	
Equipment serial no.	MFC 1049	3465	
Last Calibration Date	28-Sep-22	28-Jun-22	
Next Calibration Date	28-Nov-22	29-Jun-23	

Verification Test No.	Date	Time			K-Factor K-Factor (K=C/R)	Counts/ Minute (R) x-axis	Total Counts (TC)	TSP Sample ID No.	Dust Concentration (ug/m3), (C)
		Start-time	End-time	Elapsed Time (in min)					y axis
1	9/10/2022	6210.34	6213.34	180.00	0.00122	28.00	5040	R221670/1	34
2	9/10/2022	6213.34	6216.36	181.20	0.00103	64.00	11597	R221670/2	66
3	9/10/2022	6216.36	6221.78	325.20	0.00120	85.67	27859	R221670/3	103
4	16/10/2022	6249.91	6252.92	180.60	0.00102	53.00	9571.8	R221671/1	54
5	16/10/2022	6252.92	6255.92	180.00	0.00114	77.33	13920	R221671/2	88
6	16/10/2022	6255.92	6261.94	361.20	0.00116	71.33	25766	R221671/3	83
					0.00113				

K-Factor to be inputted in LD-5R (corrected 1 decimal point): 1.1

By Linear Regression of y on x:

slope, mh= 1.1948

intercept, ch= -4.2432

\*Correlation Coefficient, R= 0.9806

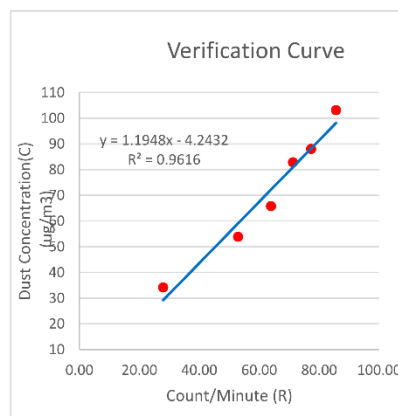
Verification Test Result: Strong Correlation, Results were accepted.

\* If the Correlation Coefficient, R is <0.5. Checking and Re-verification are required.

Verified By: \_\_\_\_\_

Field Supervisor

Date: 19-10-2022





Website: www.acuityhk.com  
 Unit E, 12/F, Ford Glory Plaza  
 Nos. 37-39, Wai Hong Street,  
 Cheung Sha Wan, Kowloon.  
 Tel.: (852) 2698 6833  
 Fax: (852) 2698 9383

### Sibata LD-5R K-Factor Verification Test by Total Suspended Particulates HVS Test Report

Verification Test Date: 27-Mar-22 to 3-Apr-22  
 Next Verification Test Date: 4-Apr-23  
 Unit-under-Test- Model No. Sibata LD-5R  
 Unit-under-Test Serial No. OZ4544  
 Our Report Reference No. RPT-22-HVS-0005

Standard Equipment Information		
Verification Equipment Type	Tisch's TSP HVS	Tish HVS Calibrator
Standard Equipment Model No.	TE-5170X	TE-5028A
Equipment serial no.	MFC 1049	3702
Last Calibration Date	22-Mar-22	3-Aug-21
Next Calibration Date	21-Jun-22	4-Aug-22

Verification Test No.	Date	Time			K-Factor K-Factor (K=C/R)	Counts/ Minute (R) x-axis	Total Counts (TC)	TSP Sample ID No.	Dust Concentration (ug/m3), (C) y axis
		Start-time	End-time	Elapsed Time (in min)					
1	27/3/2022	4945.81	4949.09	196.80	0.00077	65	12858	R220486/1	50
2	27/3/2022	4949.09	4952.83	224.40	0.00077	69	15558	R220486/2	53
3	27/3/2022	4952.83	4956.42	215.40	0.00076	62	13355	R220486/3	47
4	3/4/2022	4991.80	4995.40	216.00	0.00046	49	10656	R220538/1	22
5	3/4/2022	4995.40	4998.79	203.40	0.00045	52	10645	R220538/2	23
6	3/4/2022	4998.79	5002.26	208.20	0.00064	58	12006	R220538/3	37
					0.00064				

K-Factor to be inputted in LD-5R (corrected 1 decimal point): 0.6

By Linear Regression of y on x:

slope, mh= 1.7356

intercept, ch= -64.0225

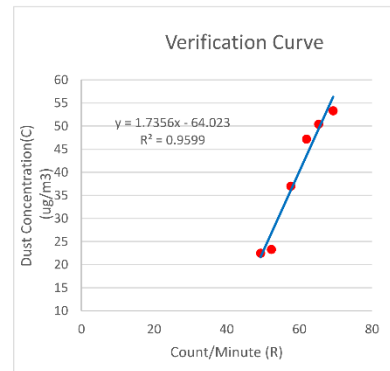
\*Correlation Coefficient, R= 0.9797

Verification Test Result: Strong Correlation, Results were accepted.

\* If the Correlation Coefficient, R is <0.5. Checking and Re-verification are required.

Verified By:   
 Field Supervisor

Date: 14-04-2022





<b>RECALIBRATION DUE DATE:</b>
<b>June 28, 2023</b>

## Certificate of Calibration

Calibration Certification Information			
Cal. Date: June 28, 2022	Rootsmeter S/N: 438320	Ta: 296	°K
Operator: Jim Tisch		Pa: 755.1	mm Hg
Calibration Model #: TE-5025A	Calibrator S/N: 3465		

Run	Vol. Init (m3)	Vol. Final (m3)	ΔVol. (m3)	ΔTime (min)	ΔP (mm Hg)	ΔH (in H2O)
1	1	2	1	1.4290	3.2	2.00
2	3	4	1	1.0130	6.4	4.00
3	5	6	1	0.9050	7.9	5.00
4	7	8	1	0.8590	8.8	5.50
5	9	10	1	0.7110	12.8	8.00

Data Tabulation					
Vstd (m3)	Qstd (x-axis)	$\sqrt{\Delta H \left( \frac{Pa}{Pstd} \right) \left( \frac{Tstd}{Ta} \right)}$ (y-axis)	Va	Qa (x-axis)	$\sqrt{\Delta H \left( \frac{Ta}{Pa} \right)}$ (y-axis)
0.9961	0.6970	1.4144	0.9958	0.6968	0.8854
0.9918	0.9791	2.0003	0.9915	0.9788	1.2522
0.9899	1.0938	2.2364	0.9895	1.0934	1.4000
0.9887	1.1509	2.3456	0.9883	1.1506	1.4683
0.9834	1.3831	2.8289	0.9830	1.3826	1.7708
<b>QSTD</b>	<b>m= 2.05924</b>		<b>QA</b>	<b>m= 1.28946</b>	
	<b>b= -0.01929</b>			<b>b= -0.01207</b>	
	<b>r= 0.99998</b>			<b>r= 0.99998</b>	

Calculations	
Vstd= $\Delta Vol \left( \frac{Pa - \Delta P}{Pstd} \right) \left( \frac{Tstd}{Ta} \right)$	Va= $\Delta Vol \left( \frac{Pa - \Delta P}{Pa} \right)$
Qstd= Vstd/ΔTime	Qa= Va/ΔTime
For subsequent flow rate calculations:	
Qstd= $1/m \left( \left( \sqrt{\Delta H \left( \frac{Pa}{Pstd} \right) \left( \frac{Tstd}{Ta} \right)} \right) - b \right)$	Qa= $1/m \left( \left( \sqrt{\Delta H \left( \frac{Ta}{Pa} \right)} \right) - b \right)$

Standard Conditions	
Tstd:	298.15 °K
Pstd:	760 mm Hg
Key	
ΔH: calibrator manometer reading (in H2O)	
ΔP: rootsmeter manometer reading (mm Hg)	
Ta: actual absolute temperature (°K)	
Pa: actual barometric pressure (mm Hg)	
b: intercept	
m: slope	

RECALIBRATION
US EPA recommends annual recalibration per 1998 40 Code of Federal Regulations Part 50 to 51, Appendix B to Part 50, Reference Method for the Determination of Suspended Particulate Matter in the Atmosphere, 9.2.17, page 30

Tisch Environmental, Inc.  
 145 South Miami Avenue  
 Village of Cleves, OH 45002

[www.tisch-env.com](http://www.tisch-env.com)  
 TOLL FREE: (877)263-7610  
 FAX: (513)467-9009

**InnoTech Instrumentation Co. Ltd.**

創新科儀有限公司

**HIVOL SAMPLER CALIBRATION DATA SHEET (TSP)**

Site Information

Location:	The admin building inside the construction site	Site ID:	A1a	Date:	02-Dec-2022
Serial No.:	1048	Model:	TE-5170X	Operator:	Kate Wong

Ambient Condition

Corrected Pressure (mm Hg):	765.0	Temperature (deg K):	293.4
-----------------------------	-------	----------------------	-------

Calibration Orifice

Model:	TE-5025A	Slope:	1.28946
Serial No.:	3465	Intercept:	-0.01207
Calibration Due Date:	28-Jun-23	Corr. Coeff:	0.99998

Calibration Data

Plate or Test #	In,H2O (in)	Qa, X-Axis (m3/min)	I, CFM (chart)	IC, Y-Axis (corrected)
1	0.10	0.257	24.0	24.27
2	0.30	0.439	27.0	27.30
3	0.50	0.564	30.0	30.34
4	0.60	0.617	32.0	32.36
5	0.80	0.711	34.0	34.38

Sampler Calibration Relationship (Qa on x-axis, IC on y-axis)

m= 22.7190      b= 17.9713      Corr. Coeff= 0.9921  
 Sampler set point(SSP) 45 CFM

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

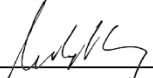
Qstd = standard flow rate  
 IC = corrected chart response  
 I = actual chart response

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:  
 (1.21\*m+b)/[ $\sqrt{298/Tav}(Pav/760)$ ]

Calculations

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

Checked by: 

Date: 02-Dec-2022

**InnoTech Instrumentation Co. Ltd.**

創新科儀有限公司

**HIVOL SAMPLER CALIBRATION DATA SHEET (TSP)**

Site Information

Location:	The existing outfall pumping station inside the construction site	Site ID:	A2a	Date:	02-Dec-2022
Serial No:	1085	Model:	TE-5170X	Operator:	Kate Wong

Ambient Condition

Corrected Pressure (mm Hg):	765.0	Temperature (deg K):	293.4
-----------------------------	-------	----------------------	-------

Calibration Orifice

Model:	TE-5025A	Slope:	1.28946
Serial No.:	3465	Intercept:	-0.01207
Calibration Due Date:	28-Jun-23	Corr. Coeff:	0.99998

Calibration Data

Plate or Test #	In,H2O (in)	Qa, X-Axis (m3/min)	I, CFM (chart)	IC, Y-Axis (corrected)
1	0.10	0.257	28.0	28.31
2	0.30	0.439	30.0	30.34
3	0.60	0.617	31.0	31.35
4	0.80	0.711	34.0	34.38
5	1.00	0.794	37.0	37.41

Sampler Calibration Relationship (Qa on x-axis, IC on y-axis)

m=	15.5180	b=	23.6143	Corr. Coeff=	0.9378
Sampler set point(SSP)		42	CFM		

$Q_{std} = 1/m[\sqrt{H_2O(P_a/P_{std})(T_{std}/T_a)}] - b$   
 $IC = I[\sqrt{P_a/P_{std}}](T_{std}/T_a)$

$Q_{std}$  = standard flow rate  
 $IC$  = corrected chart response  
 $I$  = actual chart response

$m$  = calibrator  $Q_{std}$  slope  
 $b$  = calibrator  $Q_{std}$  intercept  
 $T_a$  = actual temperature during calibration (deg K)  
 $P_a$  = actual pressure during calibration (mm Hg)  
 $T_{std}$  = 298 deg K  
 $P_{std}$  = 760 mm Hg

For subsequent calculation of sampler flow:  
 $(1.21 * m + b) / [\sqrt{298/T_a}(P_{av}/760)]$

Calculations

$m$  = sampler slope  
 $b$  = sampler intercept  
 $I$  = chart response  
 $T_{av}$  = average temperature  
 $P_{av}$  = average pressure

Checked by: 

Date: 02-Dec-2022

# APPENDIX D

## Monitoring Data (Air)



Location: A1a

Monitoring Period: December 2022

Parameter : TSP 1-hour

Major Dust Source Construction activities and daily operation of the sewerage treatment plant

Other Factors NA

Date	Weather	Start Time	1 <sup>st</sup> Hour ( $\mu\text{g}/\text{m}^3$ )	2 <sup>nd</sup> Hour ( $\mu\text{g}/\text{m}^3$ )	3 <sup>rd</sup> Hour ( $\mu\text{g}/\text{m}^3$ )
2022/12/5	Sunny	13:38	85	76	85
2022/12/12	Sunny	13:27	90	81	83
2022/12/19	Sunny	13:26	74	69	75
2022/12/22	Sunny	14:45	65	76	79
2022/12/29	Fine	13:47	70	74	81
<b>Range</b>			65 - 90		
<b>Average</b>			77.5		



Location: A2a

Monitoring Period: December 2022

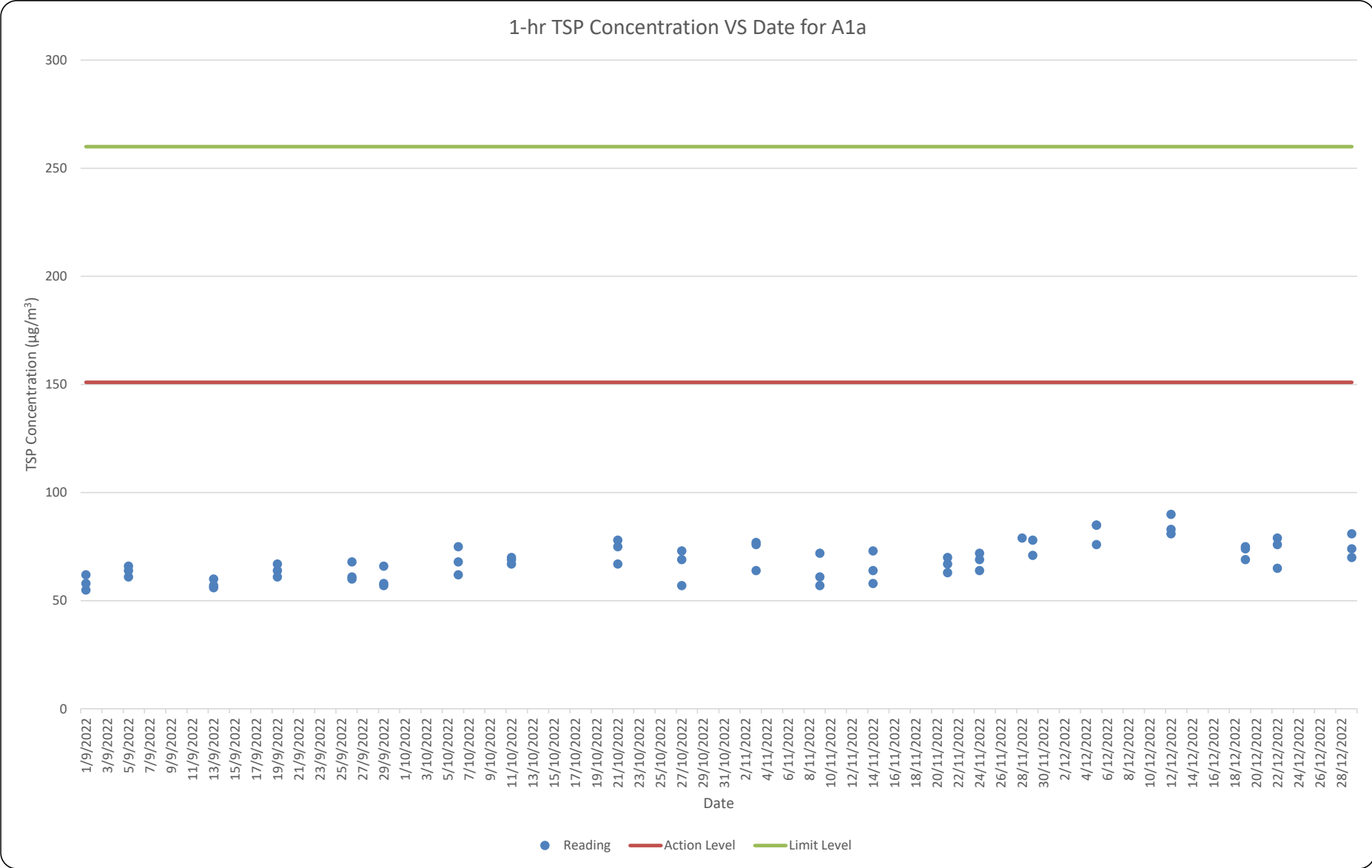
Parameter : TSP 1-hour

Major Dust Source Construction activities and daily operation of the sewerage treatment plant

Other Factors NA

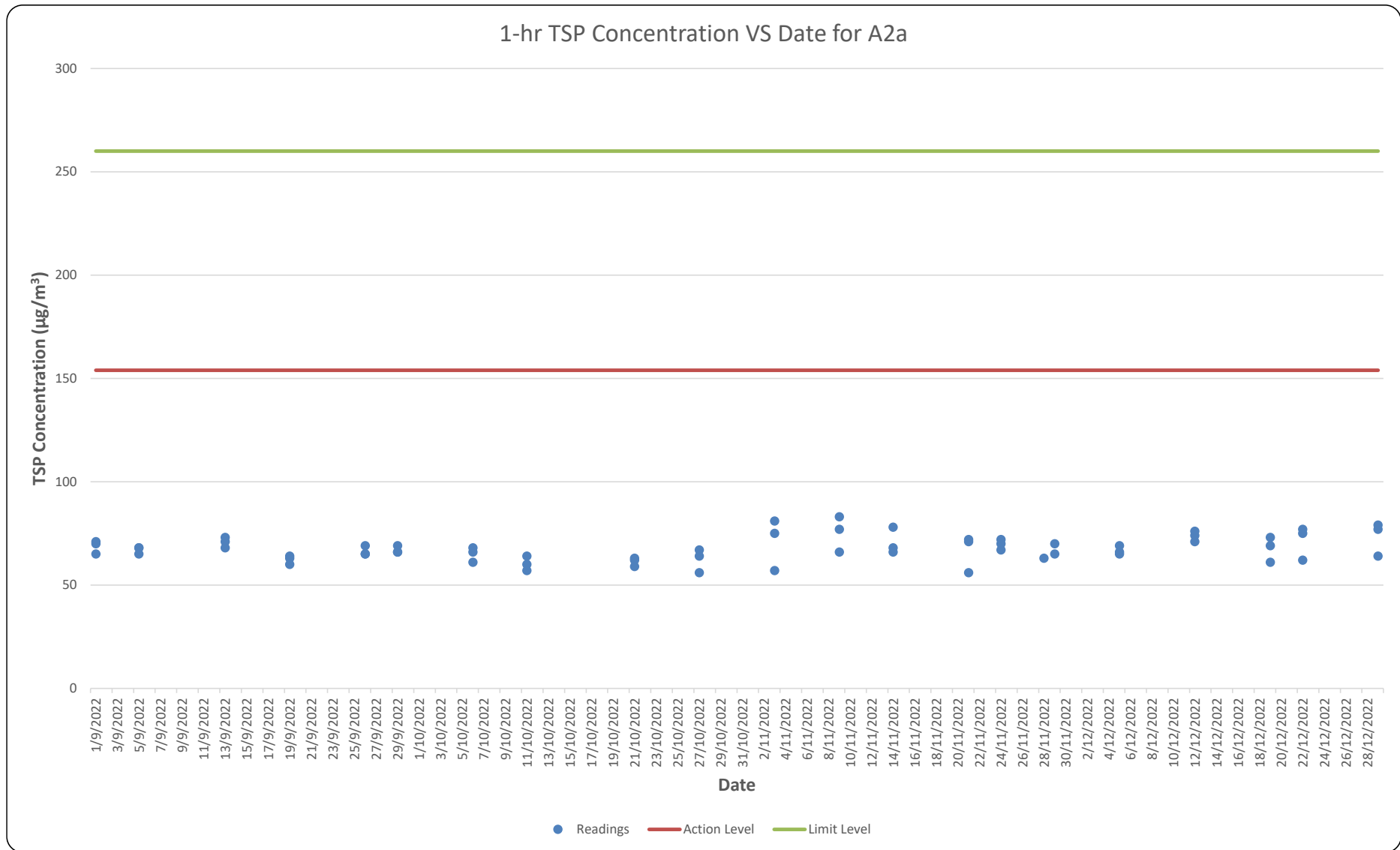
Date	Weather	Start Time	1 <sup>st</sup> Hour ( $\mu\text{g}/\text{m}^3$ )	2 <sup>nd</sup> Hour ( $\mu\text{g}/\text{m}^3$ )	3 <sup>rd</sup> Hour ( $\mu\text{g}/\text{m}^3$ )
2022/12/5	Sunny	13:27	66	65	69
2022/12/12	Sunny	13:16	74	76	71
2022/12/19	Sunny	13:17	61	69	73
2022/12/22	Sunny	14:27	75	77	62
2022/12/29	Fine	13:59	64	79	77
<b>Range</b>			61 - 79		
<b>Average</b>			72.3		

Figure D.1 Measured 1-Hour TSP at the admin building inside the construction site (A1a)



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Figure D.2 Measured 1-Hour TSP at the existing outfall pumping station inside the construction site (A2a)



Location: A1a  
 Parameter : TSP 24-hour  
 Major dust source Construction activities and daily operation of the sewerage treatment plant  
 Other Factors NA

Start Date	Avg Air Temp	Avg Atmospheric Pressure	Weather Condition	Elapse Time		Sampling Time	Flow Rate	Standard Air Volume	Filter Weight (g)		Particulate weight	Conc.
	(°C)	(mm Hg)		Initial (min)	Final (min)	Actual (min)	(m <sup>3</sup> /min)	(m <sup>3</sup> )	Initial	Final	(g)	(µg/m <sup>3</sup> )
05/12/2022	17.5	1019.8	Sunny	238283.0	239802.0	1519.0	1.09	1661	2.7599	2.9566	0.1967	118
12/12/2022	15.4	1018.9	Cloudy	239802.0	241304.0	1502.0	1.05	1583	2.7864	2.9595	0.1731	109
19/12/2022	15.3	1020.0	Sunny	241304.0	242821.0	1517.0	1.06	1602	2.7875	2.9015	0.1140	71
22/12/2022	17.2	1017.8	Sunny	242821.0	244287.0	1466.0	1.05	1533	2.7749	2.9798	0.2049	134
29/12/2022	15.9	1024.7	Fine	244287.0	245742.0	1455.0	1.11	1612	2.6303	2.8698	0.2395	149
											Average	96173116
											Range	71 - 149

Location: A2a  
 Parameter : TSP 24-hour  
 Major Site Activities Construction activities and daily operation of the sewerage treatment plant  
 Major dust source Routine operation of the Sewage Treatment Plant  
 Other Factors NA

Contract No. DC/2019/07  
 Environmental Monitoring Works for  
 Upgrading of Cheung Chau Sewage Collection, Treatment and Disposal Facilities  
 17<sup>th</sup> EM&A Report – December 2022

Start Date	Avg Air Temp	Avg Atmospheric Pressure	Weather Condition	Elapse Time		Sampling Time	Flow Rate	Standard Air Volume	Filter Weight (g)		Particulate weight	Conc.
	(°C)	(mm Hg)		Initial (min)	Final (min)	Actual (min)	(m <sup>3</sup> /min)	(m <sup>3</sup> )	Initial	Final	(g)	(µg/m <sup>3</sup> )
05/12/2022	17.5	1019.8	Sunny	457198.0	458716.0	1518.00	1.11	1678	2.755	2.8202	0.0652	39
12/12/2022	15.4	1018.9	Cloudy	458716.0	460214.0	1498.00	1.11	1668	2.7907	2.9579	0.1672	100
19/12/2022	15.3	1020.0	Sunny	460214.0	461681.0	1467.00	1.12	1638	2.7787	2.8935	0.1148	70
22/12/2022	17.2	1017.8	Sunny	461681.0	463148.0	1467.00	1.10	1617	2.7895	3.0078	0.2183	135
29/12/2022	15.9	1024.7	Fine	463148.0	464606.0	1458.00	1.16	1689	2.6373	2.8714	0.2341	139
											Average	97
											Range	39 - 139

Figure D.3 Measured 24-Hour TSP at the admin building inside the construction site (A1a)

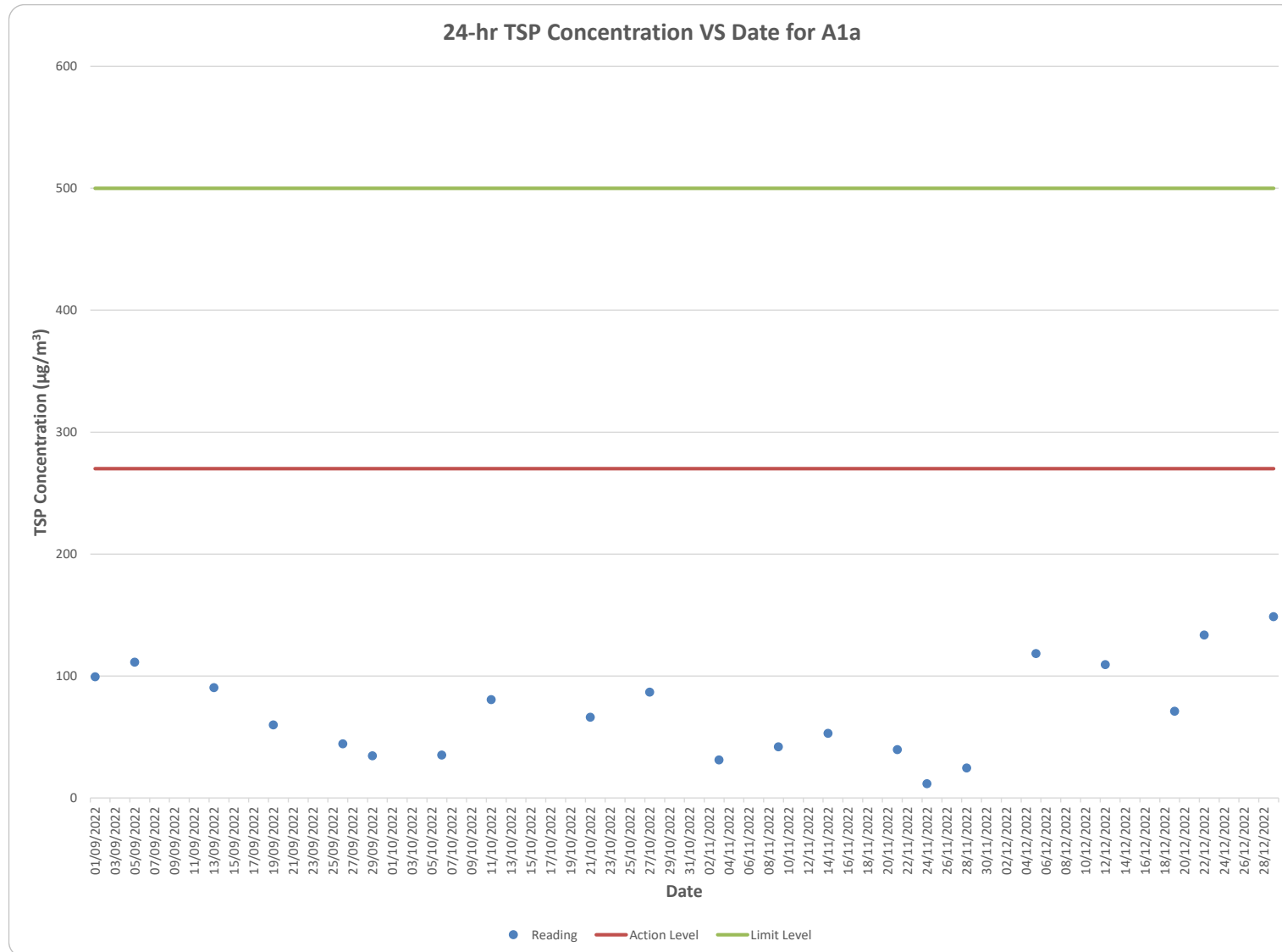
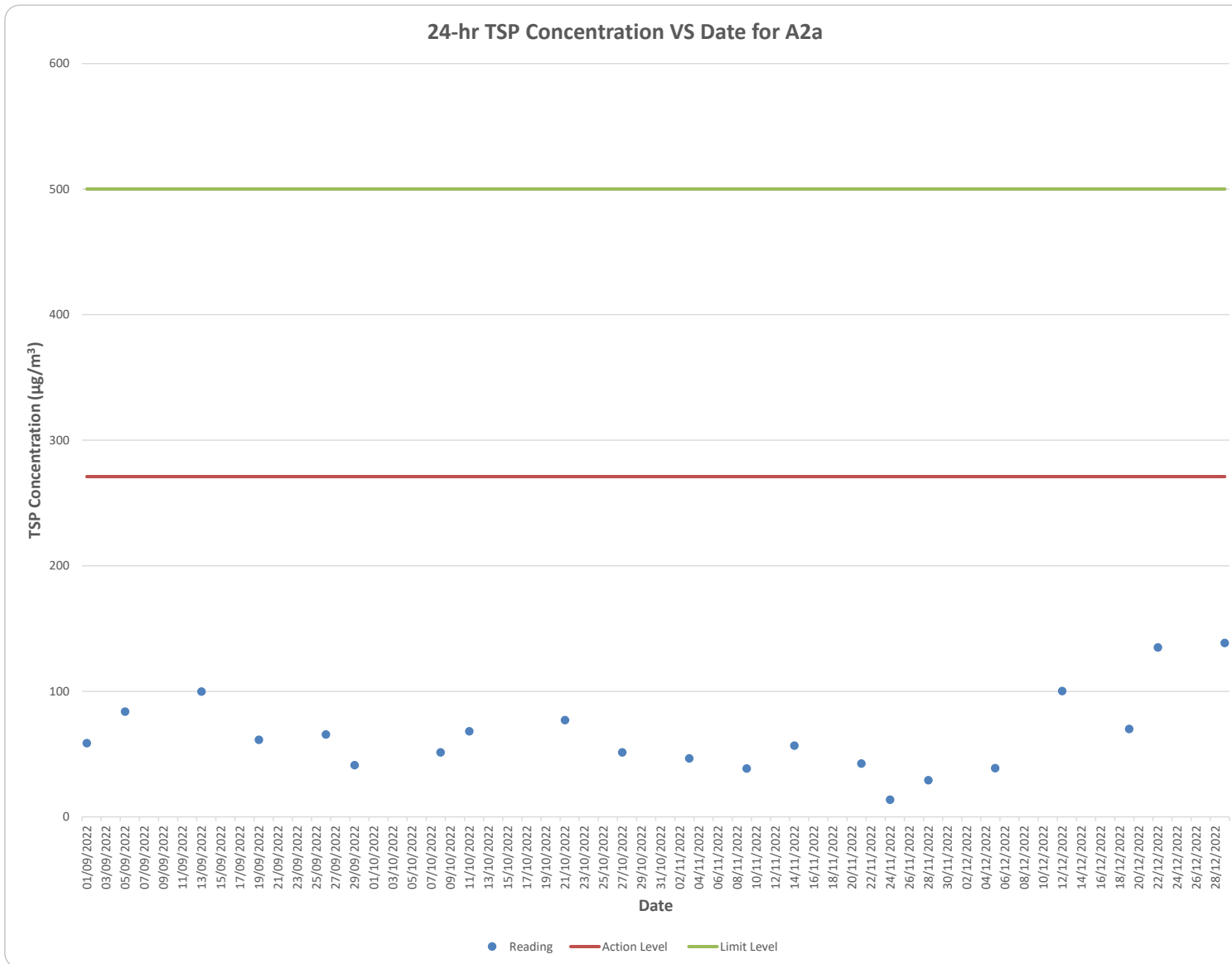


Figure D.4 Measured 24-Hour TSP at the existing outfall pumping station inside the construction site (A2a)





# APPENDIX E

## Calibration Certificates (Noise)



# Certificate of Calibration

for

**Description:** Sound Level Meter  
**Manufacturer:** SVANTEK  
**Type No.:** 971 (Serial No.: 103482)  
**Microphone:** ACO 7052E (Serial No.: 79788)  
**Preamplifier:** SV18 (Serial No.: 103880)

**Submitted by:**

**Customer:** Acuity Sustainability Consulting Limited  
**Address:** Unit 1908, Nos. 301-305 Castle Peak Road, Kwai Chung, N.T.

Upon receipt for calibration, the instrument was found to be:

- Within (31.5 Hz to 4000Hz)  
 Outside


the allowable tolerance.


The test equipment used for calibration are traceable to National Standards via:

- The Government of The Hong Kong Special Administrative Region Standard & Calibration Laboratory

**Date of receipt:** 9 March 2022

**Date of calibration:** 11 March 2022

**Calibrated by:**   
Calibration Technician

**Certified by:**   
Mr. Ng Yan Wa  
Laboratory Manager

**Date of issue:** 11 March 2022



Certificate No.: APJ21-163-CC001

Page 1 of 4



**1. Calibration Precaution:**

- The unit-under-test (UUT) was allowed to stabilize in the laboratory for over 24 hours, and switched on to warm up for over 10 minutes before the commencement of the test.
- The results presented are the mean of 3 measurements at each calibration point.

**2. Calibration Conditions:**

Air Temperature: 23 °C  
 Air Pressure: 1006 hPa  
 Relative Humidity: 65 %

**3. Calibration Equipment:**

	Type	Serial No.	Calibration Report Number	Traceable to
Multifunction Calibrator	B&K 4226	2288467	AV200041	HOKLAS

**4. Calibration Results**

Sound Pressure Level

Reference Sound Pressure Level

Setting of Unit-under-test (UUT)			Applied value		UUT Reading,	IEC 61672 Class 1
Range, dB	Freq. Weighting	Time Weighting	Level, dB	Frequency, Hz	dB	Specification, dB
25-124	dBA SPL	Fast	94	1000	94.0	±0.4

Linearity

Setting of Unit-under-test (UUT)			Applied value		UUT Reading,	IEC 61672 Class 1
Range, dB	Freq. Weighting	Time Weighting	Level, dB	Frequency, Hz	dB	Specification, dB
25-124	dBA SPL	Fast	94	1000	94.0	Ref
			104		104.0	±0.3
			114		114.0	±0.3

Time Weighting

Setting of Unit-under-test (UUT)			Applied value		UUT Reading,	IEC 61672 Class 1
Range, dB	Freq. Weighting	Time Weighting	Level, dB	Frequency, Hz	dB	Specification, dB
25-124	dBA SPL	Fast	94	1000	94.0	Ref
		Slow			94.0	±0.3

Certificate No.: APJ21-163-CC001



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 Homepage: <http://www.aa-lab.com> E-mail: [inquiry@aa-lab.com](mailto:inquiry@aa-lab.com)



Frequency Response

Linear Response

Setting of Unit-under-test (UUT)				Applied value		UUT Reading,	IEC 61672 Class 1
Range, dB	Freq. Weighting	Time Weighting	Level, dB	Frequency, Hz	dB	Specification, dB	
25-124	dB	SPL	Fast	94	31.5	94.4	±2.0
					63	94.3	±1.5
					125	94.2	±1.5
					250	94.1	±1.4
					500	94.1	±1.4
					1000	94.0	Ref
					2000	93.7	±1.6
					4000	93.0	±1.6

A-weighting

Setting of Unit-under-test (UUT)				Applied value		UUT Reading,	IEC 61672 Class 1
Range, dB	Freq. Weighting	Time Weighting	Level, dB	Frequency, Hz	dB	Specification, dB	
25-124	dBA	SPL	Fast	94	31.5	55.0	-39.4±2.0
					63	68.0	-26.2±1.5
					125	78.0	-16.1±1.5
					250	85.4	-8.6±1.4
					500	90.8	-3.2±1.4
					1000	94.0	Ref
					2000	94.8	+1.2±1.6
					4000	94.0	+1.0±1.6

C-weighting

Setting of Unit-under-test (UUT)				Applied value		UUT Reading,	IEC 61672 Class 1
Range, dB	Freq. Weighting	Time Weighting	Level, dB	Frequency, Hz	dB	Specification, dB	
25-124	dBC	SPL	Fast	94	31.5	91.4	-3.0±2.0
					63	93.5	-0.8±1.5
					125	94.0	-0.2±1.5
					250	94.1	-0.0±1.4
					500	94.1	-0.0±1.4
					1000	94.0	Ref
					2000	93.6	-0.2±1.6
					4000	92.2	-0.8±1.6

Certificate No.: APJ21-163-CC001



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## 5. Calibration Results Applied

The results apply to the particular unit-under-test only. All calibration points are within manufacture's specification as IEC 61672 Class 1.

Uncertainties of Applied Value:

94 dB	31.5 Hz	± 0.05
	63 Hz	± 0.05
	125 Hz	± 0.05
	250 Hz	± 0.05
	500 Hz	± 0.05
	1000 Hz	± 0.05
	2000 Hz	± 0.05
	4000 Hz	± 0.05
104 dB	1000 Hz	± 0.05
114 dB	1000 Hz	± 0.05

The uncertainties are evaluated for a 95% confidence level.

Note:

The values given in this certification only related to the values measured at the time of the calibration and any uncertainties quoted will not allow for the equipment long-term drift, variations with environmental changes, vibration and shock during transportation, overloading, mis-handling, or the capability of any other laboratory to repeat the calibration. (A+A)\*L shall not be liable for any loss or damage resulting from the use of the equipment.

Certificate No.: APJ21-163-CC001



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# Certificate of Calibration

for

**Description:** Sound Level Meter  
**Manufacturer:** NTi Audio  
**Type No.:** XL2 (Serial No.: A2A-13663-E0)  
**Microphone:** ACO 7052 (Serial No.: 73780)  
**Preamplifier:** NTi Audio MA220 (Serial No.:10390)

**Submitted by:**

**Customer:** Acuity Sustainability Consulting Limited  
**Address:** Unit C, 11/F, Ford Glory Plaza, No. 37-39 Wing Hong Street, Cheung Sha Wan, Kowloon

Upon receipt for calibration, the instrument was found to be:

- Within (31.5 Hz – 4k Hz)  
 Outside


the allowable tolerance.

The test equipment used for calibration are traceable to National Standards via:

- The Government of The Hong Kong Special Administrative Region Standard & Calibration Laboratory

**Date of receipt:** 21 February 2022

**Date of calibration:** 24 February 2022

**Calibrated by:**   
Calibration Technician

**Certified by:**   
Mr. Tang Cheuk Hang  
Quality Manager

**Date of issue:** 24 February 2022

**Certificate No.:** APJ21-157-CC001



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Homepage: <http://www.aa-lab.com> E-mail: [inquiry@aa-lab.com](mailto:inquiry@aa-lab.com)





**1. Calibration Precaution:**

- The unit-under-test (UUT) was allowed to stabilize in the laboratory for over 24 hours, and switched on to warm up for over 10 minutes before the commencement of the test.
- The results presented are the mean of 3 measurements at each calibration point.

**2. Calibration Conditions:**

Air Temperature: 18.4°C  
 Air Pressure: 1018 hPa  
 Relative Humidity: 47.2 %

**3. Calibration Equipment:**

	Type	Serial No.	Calibration Report Number	Traceable to
Multifunction Calibrator	B&K 4226	2288467	AV200041	HOKLAS

**4. Calibration Results**

Sound Pressure Level

Reference Sound Pressure Level

Setting of Unit-under-test (UUT)				Applied value		UUT Reading	IEC 61672 Class 1
Range, dB	Freq. Weighting	Time Weighting	Level, dB	Frequency, Hz	dB	Specification, dB	
30-130	dBA SPL	Fast	94	1000	94.0	±0.4	

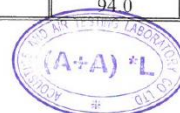
Linearity

Setting of Unit-under-test (UUT)				Applied value		UUT Reading	IEC 61672 Class 1
Range, dB	Freq. Weighting	Time Weighting	Level, dB	Frequency, Hz	dB	Specification, dB	
30-130	dBA SPL	Fast	94	1000	94.0	Ref	
			104		104.0	±0.3	
			114		114.0	±0.3	

Time Weighting

Setting of Unit-under-test (UUT)				Applied value		UUT Reading	IEC 61672 Class 1
Range, dB	Freq. Weighting	Time Weighting	Level, dB	Frequency, Hz	dB	Specification, dB	
30-130	dBA SPL	Fast	94	1000	94.0	Ref	
		Slow			94.0	±0.3	

Certificate No.: APJ21-157-CC001



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 Homepage: <http://www.aa-lab.com> E-mail: [inquiry@aa-lab.com](mailto:inquiry@aa-lab.com)



Frequency Response

Linear Response

Setting of Unit-under-test (UUT)				Applied value		UUT Reading	IEC 61672 Class 1
Range, dB	Freq. Weighting	Time Weighting	Level, dB	Frequency, Hz	dB	Specification, dB	
30-130	dB	SPL	Fast	94	31.5	94.1	±2.0
					63	94.1	±1.5
					125	94.1	±1.5
					250	94.0	±1.4
					500	94.0	±1.4
					1000	94.0	Ref
					2000	93.8	±1.6
				4000	93.3	±1.6	

A-weighting

Setting of Unit-under-test (UUT)				Applied value		UUT Reading	IEC 61672 Class 1
Range, dB	Freq. Weighting	Time Weighting	Level, dB	Frequency, Hz	dB	Specification, dB	
30-130	dBA	SPL	Fast	94	31.5	54.8	-39.4±2.0
					63	67.9	-26.2±1.5
					125	78.0	-16.1±1.5
					250	85.4	-8.6±1.4
					500	90.8	-3.2±1.4
					1000	94.0	Ref
					2000	95.0	+1.2±1.6
				4000	94.3	+1.0±1.6	

C-weighting

Setting of Unit-under-test (UUT)				Applied value		UUT Reading	IEC 61672 Class 1
Range, dB	Freq. Weighting	Time Weighting	Level, dB	Frequency, Hz	dB	Specification, dB	
30-130	dBC	SPL	Fast	94	31.5	91.1	-3.0±2.0
					63	93.3	-0.8±1.5
					125	93.9	-0.2±1.5
					250	94.0	-0.0±1.4
					500	94.1	-0.0±1.4
					1000	94.0	Ref
					2000	93.6	-0.2±1.6
				4000	92.5	-0.8±1.6	

Certificate No.: APJ21-157-CC001



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## 5. Calibration Results Applied

The results apply to the particular unit-under-test only. All calibration points are within manufacture's specification as IEC 61672 Class 1.

Uncertainties of Applied Value:

94 dB	31.5 Hz	± 0.05
	63 Hz	± 0.10
	125 Hz	± 0.05
	250 Hz	± 0.05
	500 Hz	± 0.05
	1000 Hz	± 0.05
	2000 Hz	± 0.05
	4000 Hz	± 0.05
104 dB	1000 Hz	± 0.05
114 dB	1000 Hz	± 0.05

The uncertainties are evaluated for a 95% confidence level.

Note:

The values given in this certification only related to the values measured at the time of the calibration and any uncertainties quoted will not allow for the equipment long-term drift, variations with environmental changes, vibration and shock during transportation, overloading, mis-handling, or the capability of any other laboratory to repeat the calibration. (A+A)\*L shall not be liable for any loss or damage resulting from the use of the equipment.

Certificate No.: APJ21-157-CC001



Page 4 of 4

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Homepage: <http://www.aa-lab.com> E-mail: [inquiry@aa-lab.com](mailto:inquiry@aa-lab.com)



## CALIBRATION CERTIFICATE

Product : SOUND CALIBRATOR  
Type : NC-75  
Serial number : 34724244  
Manufacturer : RION CO., LTD.  
Calibration quantities : Sound pressure level (with reference standard microphone)  
Calibration method : Measured by specified secondary standard microphone  
according to JCSS calibration procedure specified by RION.  
Ambient conditions : Temperature 23.9 °C, Relative humidity 49 %,  
Static pressure 99.9 kPa  
Calibration date : 05/07/2022 (DD/MM/YYYY)  
Calibration location : 3-20-41 Higashimotomachi, Kokubunji, Tokyo 185-8533, Japan  
RION CO., LTD. Calibration Room

We hereby certify that the results of this calibration were as follows.

Issue date : 11/07/2022 (DD/MM/YYYY)

Junichi Kawamura  
Manager  
Quality Assurance Section,  
Quality Assurance Department,  
Environmental Instrument Division,  
RION CO., LTD.  
3-20-41 Higashimotomachi, Kokubunji,  
Tokyo 185-8533, Japan



This certificate is based on article 144 of the Measurement Law and indicates the result of calibration in accordance with measurement standards traceable to Primary Measurement Standards (National Standards) which realizes the physical units of measurement according to the International System of Units (SI).

The accreditation symbol is attestation of which the result of calibration is traceable to Primary Measurement Standards (National Standards).

The certificate shall not be reproduced except in full, without the written approval of the issuing laboratory.

The calibration laboratory who issued this calibration certificate conforms to ISO/IEC 17025:2017.

This calibration certificate was issued by the calibration laboratory accredited by IA Japan who is a signatory to the Mutual Recognition Arrangement (MRA) of International Laboratory Accreditation Cooperation (ILAC) and Asia Pacific Accreditation Cooperation (APAC). This (These) calibration result(s) may be accepted internationally through ILAC/APAC MRA.





## CALIBRATION RESULT

### 1. Sound pressure level (with reference standard microphone)

Measured value	Expanded uncertainty *1
93.99 dB	0.09 dB

Specified secondary standard microphone:

Type : 4160  
Serial number : 2973341  
Reference Sound pressure :  $2 \times 10^{-5}$  Pa

\*1 Defines an interval estimated to have a level of confidence of approximately 95 %.

Coverage factor  $k=2$

Calibration result is the calibration value in ambient conditions during calibration.

## BE OUT OF JCSS CALIBRATION

### 1. Frequency

Measured value	Measurement uncertainty ( $k=2$ )
1000.0 Hz	$3.9 \times 10^{-4}$ Hz

Working measurement standard universal counter:

Type : 53132A  
Serial number : MY40005574  
(JCSS Calibration Certificate No. 21081499079575510)

### 2. Total distortion

Measured value
0.2 %

Working measurement standard distortion meter:

Type : VA-2230A  
Serial number : 11076061  
(A2LA Calibration Certificate No. 1501-03080)

· closing ·





## CALIBRATION CERTIFICATE

Product : SOUND CALIBRATOR  
Type : NC-75  
Serial number : 34724243  
Manufacturer : RION CO., LTD.  
Calibration quantities : Sound pressure level (with reference standard microphone)  
Calibration method : Measured by specified secondary standard microphone  
according to JCSS calibration procedure specified by RION.  
Ambient conditions : Temperature 23.9 °C, Relative humidity 49 %,  
Static pressure 99.9 kPa  
Calibration date : 05/07/2022 (DD/MM/YYYY)  
Calibration location : 3-20-41 Higashimotomachi, Kokubunji, Tokyo 185-8533, Japan  
RION CO., LTD. Calibration Room

We hereby certify that the results of this calibration were as follows.

Issue date : 11/07/2022 (DD/MM/YYYY)

Junichi Kawamura  
Manager  
Quality Assurance Section,  
Quality Assurance Department,  
Environmental Instrument Division,  
RION CO., LTD.  
3-20-41 Higashimotomachi, Kokubunji,  
Tokyo 185-8533, Japan



This certificate is based on article 144 of the Measurement Law and indicates the result of calibration in accordance with measurement standards traceable to Primary Measurement Standards (National Standards) which realizes the physical units of measurement according to the International System of Units (SI).  
The accreditation symbol is attestation of which the result of calibration is traceable to Primary Measurement Standards (National Standards).  
The certificate shall not be reproduced except in full, without the written approval of the issuing laboratory.  
The calibration laboratory who issued this calibration certificate conforms to ISO/IEC 17025:2017.  
This calibration certificate was issued by the calibration laboratory accredited by IAJapan who is a signatory to the Mutual Recognition Arrangement (MRA) of International Laboratory Accreditation Cooperation (ILAC) and Asia Pacific Accreditation Cooperation (APAC). This (These) calibration result(s) may be accepted internationally through ILAC/APAC MRA.



## CALIBRATION RESULT

### 1. Sound pressure level (with reference standard microphone)

Measured value	Expanded uncertainty *1
93.99 dB	0.09 dB

Specified secondary standard microphone:

Type : 4160  
 Serial number : 2973341  
 Reference Sound pressure :  $2 \times 10^{-5}$  Pa

\*1 Defines an interval estimated to have a level of confidence of approximately 95 %.

Coverage factor  $k=2$

Calibration result is the calibration value in ambient conditions during calibration.

## BE OUT OF JCSS CALIBRATION

### 1. Frequency

Measured value	Measurement uncertainty ( $k=2$ )
1000.0 Hz	$3.9 \times 10^{-4}$ Hz

Working measurement standard universal counter:

Type : 53132A  
 Serial number : MY40005574  
 (JCSS Calibration Certificate No. 21081499079575510)

### 2. Total distortion

Measured value
0.2 %

Working measurement standard distortion meter:

Type : VA-2230A  
 Serial number : 11076061  
 (A2LA Calibration Certificate No. 1501-03080)

- closing -





# APPENDIX F

## Monitoring Data (Noise)

Location: N2a

Monitoring Period: December 2022

Parameter : Noise

Major Noise Source: Construction activities and daily operation of the sewerage treatment plant

Other Factors NA

Date	Weather	Start Time	L <sub>eq</sub>	L <sub>10</sub>	L <sub>90</sub>
2022/12/6	Sunny	14:57	70.3	73.8	64.3
2022/12/13	Cloudy	14:36	73.2	75.3	70.6
2022/12/20	Sunny	14:50	74.4	76.0	71.7
2022/12/30	Fine	15:04	70.8	77.7	69.8
<b>Average</b>			72.5		
<b>Range</b>			70.3 – 74.4		

Location: N3a

Monitoring Period: December 2022

Parameter : Noise

Major Noise Source: Construction activities and daily operation of the sewerage treatment plant

Other Factors NA

Date	Weather	Start Time	L <sub>eq</sub>	L <sub>10</sub>	L <sub>90</sub>
2022/12/6	Sunny	13:43	73.5	75.8	67.6
2022/12/13	Cloudy	13:13	72.5	75.0	61.1
2022/12/20	Sunny	13:06	70.5	73.1	54.3
2022/12/30	Fine	14:19	66.8	70.3	60.7
<b>Average</b>			71.8		
<b>Range</b>			66.8 – 73.5		

Remarks: +3 dB(A) free-field corrections have been made to N3a.

Figure F.1 Measured daytime (0700-1900) noise level at the admin building inside the construction site (N2a)

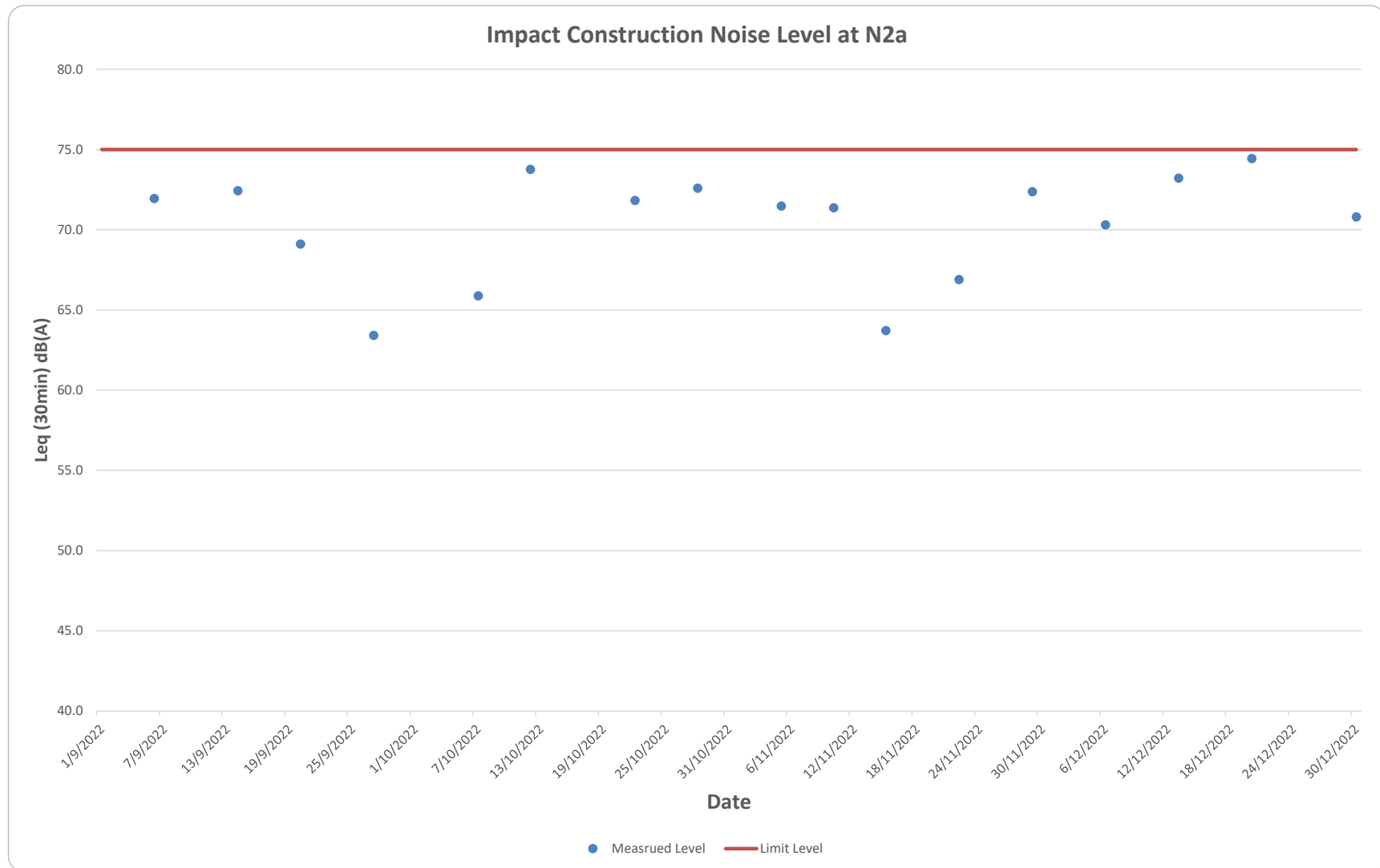
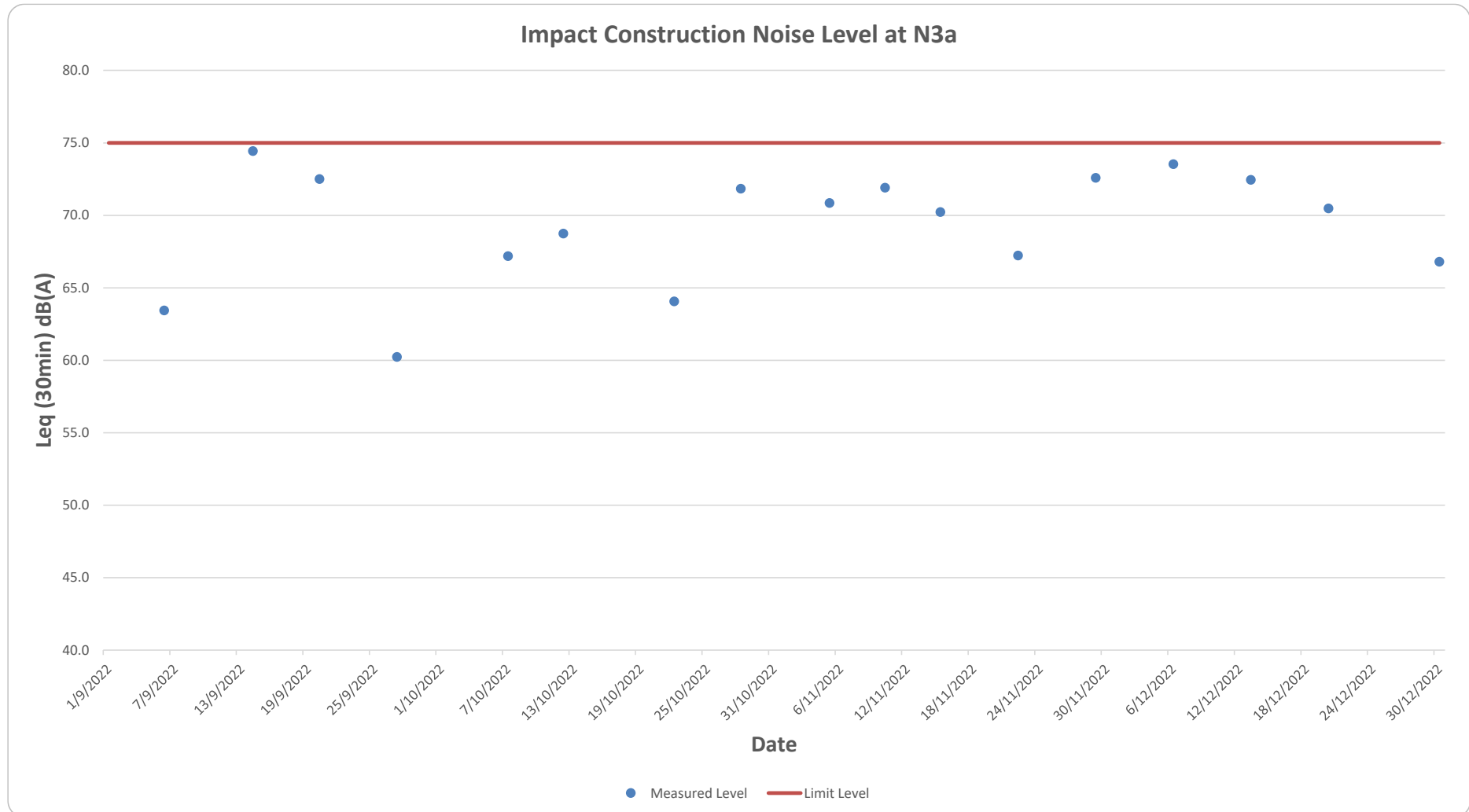


Figure F.2 Measured daytime (0700-1900) noise level at Cheung Chau Fire Station (N3a)



s: +3 dB(A) free-field corrections have been made to the data in the graph.

# APPENDIX G

## Implementation Schedule

EIA Ref.	Recommended Environmental Protection Measures/ Mitigation Measures	Objectives of the recommended measures & main concerns to address	Who to implement the measures?	Loc im
<b>Construction Phase (Upgrading Works of Cheung Chau STW and Pak She SPS (DP Component))</b>				
S.3.5.5	Appropriate dust control measures should be implemented during the construction stage in accordance with the requirements in the Air Pollution Control (Construction Dust) Regulation. Dust control techniques should be considered to control dust to a level not exceeding the AQOs as well as the 1-hour TSP guideline level of 500 µg/m <sup>3</sup> . These measures include, but are not limited to, the following: <ul style="list-style-type: none"> <li>• Adoption of good site practices;</li> <li>• Avoid practices likely to raise dust level;</li> <li>• Frequent cleaning and damping down of stockpiles and dusty areas of the site;</li> <li>• Covering the exposed areas with tarpaulin;</li> <li>• Reducing drop height during material handling;</li> <li>• Provision of wheel-washing facilities for site vehicles leaving the site;</li> <li>• Regular plant maintenance to minimize exhaust emission; and</li> <li>• Sweep up dust and debris at the end of each shift.</li> </ul>	Air Quality (fugitive dust) Control during Construction Phase	Contractors	D
S.3.10.1	All the dust control measures as recommended in the Air Pollution Control (Construction Dust) Regulation, where applicable, should be implemented. Typical dust control measures include:	Air Quality (fugitive dust) Control during Construction Phase	Contractors	

EIA Ref.	Recommended Environmental Protection Measures/ Mitigation Measures	Objectives of the recommended measures & main concerns to address	Who to implement the measures?	Location / Timing of implementation of Measures			What requirements or standards for the measures to achieve?
				D	C	O	
S.3.10.1	Watering every 1.5 hours on active works areas and paved haul roads to reduce dust emissions by 90.9% (e.g. watering intensity at 0.5 litres/m <sup>2</sup> . Actual application shall depend on the site condition and weather conditions).	Air Quality (fugitive dust) Control during Construction Phase	Contractors		√		EIA, Annex 4 and Annex 12 of EIAO -TM, Air Pollution Control (Construction Dust) Regulation
S.3.10.1	Watering every hour on unpaved areas and stockpiles of dusty materials (if no tarpaulin is provided) to reduce dust emissions by 90% (e.g. watering intensity at 1.5 litre/m <sup>2</sup> during the first hour, subsequent application at 0.2 litre/m <sup>2</sup> . Actual application shall depend on the site condition and weather conditions).	Air Quality (fugitive dust) Control during Construction Phase	Contractors		√		EIA, Annex 4 and Annex 12 of EIAO -TM, Air Pollution Control (Construction Dust) Regulation
S.3.10.1	Use of regular watering, with complete coverage, to reduce dust emissions from exposed site surfaces and unpaved roads, particularly during dry weather	Air Quality (fugitive dust) Control during Construction Phase	Contractors		√		Annex 4 and Annex 12 of EIAO -TM, Air Pollution Control (Construction Dust) Regulation
S.3.10.1	Use of frequent watering for particularly dusty construction areas and areas close to ASRs	Air Quality (fugitive dust) Control during Construction Phase	Contractors		√		Annex 4 and Annex 12 of EIAO -TM, Air Pollution Control (Construction Dust) Regulation
S.3.10.1	Vehicle washing facilities should be provided at every vehicle exit point	Air Quality (fugitive dust) Control during Construction Phase	Contractors		√		Annex 4 and Annex 12 of EIAO -TM, Air Pollution Control (Construction Dust) Regulation

EIA Ref.	Recommended Environmental Protection Measures/ Mitigation Measures	Objectives of the recommended measures & main concerns to address	Who to implement the measures?	Location / Timing of implementation of Measures			What requirements or standards for the measures to achieve?
				D	C	O	
S.3.10.1	Where a site boundary adjoins a road, streets or other areas accessible to the public, hoarding of not less than 2.4 m high from ground level should be provided along the entire length except for a site entrance or exit	Air Quality (fugitive dust) Control during Construction Phase	Contractors		√		Annex 4 and Annex 12 of EIAO -TM, Air Pollution Control (Construction Dust) Regulation
S.3.10.1	Stockpiles of imported material kept on site shall be contained within hoarding, dampened and/or covered during dry and windy weather	Air Quality (fugitive dust) Control during Construction Phase	Contractors		√		Annex 4 and Annex 12 of EIAO -TM, Air Pollution Control (Construction Dust) Regulation
S.3.10.1	Material stockpiled alongside trenches should be covered with tarpaulins	Air Quality (fugitive dust) Control during Construction Phase	Contractors		√		Annex 4 and Annex 12 of EIAO -TM, Air Pollution Control (Construction Dust) Regulation
S.3.10.1	Open stockpiles shall be avoided or covered. Where possible, prevent placing dusty material storage piles near ASRs	Air Quality (fugitive dust) Control during Construction Phase	Contractors		√		Annex 4 and Annex 12 of EIAO -TM, Air Pollution Control (Construction Dust) Regulation



EIA Ref.	Recommended Environmental Protection Measures/ Mitigation Measures	Objectives of the recommended measures & main concerns to address	Who to implement the measures?	Location / Timing of implementation of Measures			What requirements or standards for the measures to achieve?
				D	C	O	
S.3.10.1	Any excavated or stockpile of dusty material should be covered entirely by impervious sheeting or sprayed with water to maintain the entire surface wet during the non-working hours	Air Quality (fugitive dust) Control during Construction Phase	Contractors		√		Annex 4 and Annex 12 of EIAO -TM, Air Pollution Control (Construction Dust) Regulation
S.3.10.1	All dusty materials shall be sprayed with water prior to any loading, unloading or transfer operation so as to keep the dusty materials wet	Air Quality (fugitive dust) Control during Construction Phase	Contractors		√		Annex 4 and Annex 12 of EIAO -TM, Air Pollution Control (Construction Dust) Regulation
S.3.10.1	Water sprays shall be used during the delivery and handling of sands aggregates and the like	Air Quality (fugitive dust) Control during Construction Phase	Contractors		√		Annex 4 and Annex 12 of EIAO -TM, Air Pollution Control (Construction Dust) Regulation
S.3.10.1	All demolished items that may emit dust particles should be covered entirely by impervious sheeting or placed in an area sheltered on the top and the 3 sides within a day of demolition	Air Quality (fugitive dust) Control during Construction Phase	Contractors		√		Annex 4 and Annex 12 of EIAO -TM, Air Pollution Control (Construction Dust) Regulation

EIA Ref.	Recommended Environmental Protection Measures/ Mitigation Measures	Objectives of the recommended measures & main concerns to address	Who to implement the measures?	Location / Timing of implementation of Measures			What requirements or standards for the measures to achieve?
				D	C	O	
S.3.10.1	<p><u>Good site practices for concrete batching plant</u></p> <p>Every stock of more than 20 bags of cement or dry pulverized fuel ash(PFA) should be cover entirely by impervious sheeting or placed in an area sheltered on the top and the sides.</p> <p>Cement or dry PFA delivered in bulk should stored in a closed silo fitted with an audible high level alarm which is interlocked with the material filling line and no overfilling is allowed.</p> <p>Loading, unloading, transfer, handling or storage of bulk cement or dry PFA should be carried out in a totally enclosed system or facility, and any vent or exhaust should be fitted with effective fabric filter or equivalent air pollution control system (Maximum TSP emission factor of Silos and Mising Tower: 50mg/m<sup>3</sup>)</p>	Air Quality (fugitive dust) Control during Construction Phase	Contractors		√		<p>Annex 4 and Annex 12 of EIAO -TM, Air Pollution Control (Construction Dust) Regulation</p> <p>Best Practical Means for Cement Works (Concrete Batching Plant) BPM 3/2(93)</p>

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EIA Ref.	Recommended Environmental Protection Measures / Mitigation Measures	Objectives of the recommended measures & main concerns to address	Who to implement the measures?	Location / Timing of implementation of Measures	What requirements or standards for the measures to achieve?
<b>Construction Phase (Upgrading Works of Cheung Chau STW and Pak She SPS (DP Component))</b>					
S.4.4.12	Only well-maintained plant should be operated on-site and plant should be serviced regularly during the construction works.	Noise control during construction	Contractors	At all construction areas of the site during the entire construction period	EIA, Contractual requirements
S.4.4.12	Machines and plant that may be in intermittent use should be shut down between work periods or should be throttled down to a minimum.	Noise control during construction	Contractors	At all construction areas of the site during the entire construction period	EIA, Contractual requirements
S.4.4.12	Plant known to emit noise strongly in one direction should, where possible, be orientated to direct noise away from the NSRs.	Noise control during construction	Contractors	At all construction areas of the site during the entire construction period	EIA, Contractual requirements
S.4.4.12	Mobile plant should be sited as far away from NSRs as possible.	Noise control during construction	Contractors	At all construction areas of the site during the entire construction period	EIA, Contractual requirements
S.4.4.12	Material stockpiles and other structures should be effectively utilized, where practicable, to screen noise from on-site construction activities.	Noise control during construction	Contractors	At all construction areas of the site during the entire construction period	EIA, Contractual requirements

EIA Ref.	Recommended Environmental Protection Measures / Mitigation Measures	Objectives of the recommended measures & main concerns to address	Who to implement the measures?	Location / Timing of implementation of Measures	What requirements or standards for the measures to achieve?
S.4.4.13	Use of quiet plant (PME): <ul style="list-style-type: none"> <li>• Generator</li> <li>• Poker, vibratory, hand-held</li> <li>• Breaker, excavator mounted (hydraulic)</li> <li>• Excavator</li> <li>• Tracked Mobile Crane</li> <li>• Vibratory Compactor</li> <li>• Dumper</li> <li>• Air compressor</li> <li>• Concrete Pump</li> <li>• Piling Rig</li> </ul>	Noise control during construction	Contractors	At all construction areas of the site during the entire construction period	EIA, Contractual requirements
S.4.4.14	Temporary site hoardings of 2.4 m high are recommended for the works at the Pak She SPS. The hoardings will be erected along the works boundary facing the NSRs. The PME involved in the works would be screened by the erected site hoardings. Without direct line of sight from the affected NSRs, a noise reduction of 10 dB(A) could be achieved provided that the hoardings have no openings or gaps and have a surface mass of at least 7 kg/m <sup>2</sup> . Nonetheless, a -5 dB(A) screening correction for site hoardings has been applied as a more conservative approach.	Noise control during construction	Contractors	At Pak She SPS during the entire construction period	EIA
S.4.4.23	For NSRs which would be affected by more than one Works Types, good scheduling works is recommended to minimize the cumulative construction noise impacts due to different Works Types.	Noise control during construction	Contractors	Construction areas near the specified locations during the construction period	EIA, Contractual requirements

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EIA Ref.	Recommended Environmental Protection Measures / Mitigation Measures	Objectives of the recommended measures & main concerns to address	Who to implement the measures?	Location / Timing of implementation of Measures	What requirements or standards for the measures to achieve?
S.4.4.29	In order to prevent potential cumulative construction noise impacts to NSRs, the works at Tai Kwai Wan San Tsuen are recommended to be scheduled to avoid concurrent works at the areas near Tai Kwai Wan of the Improvement of Fresh Water Supply to Cheung Chau project.	Noise control during construction	DSD and Contractors	Construction areas near the specified locations during the construction period	EIA, Contractual requirements
S.4.4.30	The contractor shall liaise with “Replacement and Rehabilitation of Water Mains Stage 4, Mains on Hong Kong and Islands – Investigation, Design and Construction” contractors so as to avoid undertaking works concurrently with the works when they are in the close proximity as far as practicable.	Noise control during construction	DSD and Contractors	Construction areas near the specified locations during the construction period	EIA, Contractual requirements
S.4.4.31	The contractor shall liaise with Improvement to Existing Roads and Drains in Cheung Chau Old Town, Remaining Engineering Works Stage 3 works contractors so as to avoid undertaking works concurrently with the works when they are in the close proximity as far as practicable.	Noise control during construction	DSD and Contractors	Construction areas near the specified locations during the construction period	EIA, Contractual requirements

EIA Ref.	Recommended Environmental Protection Measures/ Mitigation Measures	Objectives of the recommended measures & main concerns to address	Who to implement the measures?	When to implement the measures?			What requirements or standards for the measures to achieve?
				D	C	O	
<b>Construction Phase (Upgrading Works of Cheung Chau STW and Pak She SPS (DP Component) and Sewers Works (non-DP Component))</b>							
S.5.7.1	<p>Practices outlined in ProPECC PN 1/94 Construction Site Drainage are recommended, as highlighted below:</p> <ul style="list-style-type: none"> <li>Perimeter channels are to be installed in works areas to intercept runoff at the site boundary prior to the commencement of any earthworks. Surface runoff should be discharged into storm drains via sand/ silt removal facilities with an adequate capacity;</li> <li>Works programme should be designed to minimize works areas to reduce soil exposure and site runoff;</li> <li>Silt removal facilities, channels and manholes should be maintained and cleaned regularly to ensure their proper functions;</li> <li>Works programme should be carefully planned to minimize the scale of soil excavation during the rainy season;</li> <li>Earthworks surfaces should be well compacted and subsequent permanent works or surface protection measures should be carried out immediately;</li> <li>All vehicles should be washed before they leave the construction site to avoid earth, mud, and debris being carried off from the site. Wash-water should be treated to remove sand and silt at least on a weekly basis to ensure the continued efficiency of the washing facility;</li> </ul>	Water Quality Control	Contractors		√		<ul style="list-style-type: none"> <li>WPCO;</li> <li>TM –Effluent Standards for Effluents Discharged into Drainage and Sewerage Systems, Inland and Coastal Water</li> </ul>



EIA Ref.	Recommended Environmental Protection Measures/ Mitigation Measures	Objectives of the recommended measures & main concerns to address	Who to implement the measures?	When to implement the measures?			What requirements or standards for the measures to achieve?
				D	C	O	
(cont...)	<ul style="list-style-type: none"> <li>Open stockpiles of construction materials on site should be covered with tarpaulin or similar fabric materials during storms;</li> <li>For sections of pipes that need to be laid underneath water courses with the open cut method, site works should be carried out during the dry season with a temporary drainage diversion; and;</li> <li>Any construction works along Hak Pai Road immediately by the Kwun Yam beach and Cheung Chau Tung Wan beach should be avoided during the swimming season.</li> </ul>	Water Quality Control	Contractors		√		<ul style="list-style-type: none"> <li>WPCO;</li> <li>TM –Effluent Standards for Effluents Discharged into Drainage and Sewerage Systems, Inland and Coastal Water</li> </ul>
S.5.7.2 and S.5.7.3	<p>Mitigations Measures for General Construction Activities:</p> <ul style="list-style-type: none"> <li>Good site practices should be adopted to regularly clean the construction sites to avoid rubbish, debris and litter from entering to nearby water bodies; and</li> <li>Good construction and site management practices should be implemented to ensure that litter, fuels, and solvents would not enter the public drainage systems.</li> </ul>	Water Quality Control	Contractors		√		<ul style="list-style-type: none"> <li>WPCO;</li> <li>TM –Effluent Standards for Effluents Discharged into Drainage and Sewerage Systems, Inland and Coastal Water</li> </ul>

EIA Ref.	Recommended Environmental Protection Measures/ Mitigation Measures	Objectives of the recommended measures & main concerns to address	Who to implement the measures?	When to implement the measures?			What requirements or standards for the measures to achieve?
				D	C	O	
S.5.7.4	Domestic sewage generated by workforce would be collected and discharged to the STW for proper treatment. Portable toilets should be provided by the Contractor, where necessary, to handle sewage from the workforce. The Contractor should also be responsible for waste disposal.	Water Quality Control	Contractors		√		<ul style="list-style-type: none"> <li>• WPCO;</li> <li>• TM –Effluent Standards for Effluents Discharged into Drainage and Sewerage Systems, Inland and Coastal Water</li> </ul>
S.5.7.5 and S.5.7.6	Mitigations Measures for Spillage of Chemicals: <ul style="list-style-type: none"> <li>• Registration to EPD as a Chemical Waste Producer if chemical wastes are generated and need to be disposed of;</li> <li>• Illegal disposal of chemicals should be strictly prohibited; and</li> <li>• Oils and fuels should only be used and stored in the designated area which has polluting prevention facilities.</li> </ul>	Water Quality Control	Contractors		√		<ul style="list-style-type: none"> <li>• WPCO;</li> <li>• TM –Effluent Standards for Effluents Discharged into Drainage and Sewerage Systems, Inland and Coastal Water</li> </ul>

EIA Ref.	Recommended Environmental Protection Measures/ Mitigation Measures	Objectives of the recommended measures & main concerns to address	Who to implement the measures?	When to implement the measures?			What requirements or standards for the measures to achieve?
				D	C	O	
<b>Construction Phase (Upgrading Works of Cheung Chau STW and Pak She SPS (DP Component) and Sewers Works (non-DP Component))</b>							
S.6.6.1	The Contractor shall prepare a Waste Management Plan in accordance with the requirements set out in the ETWB TCW No. 19/2005, Waste Management on Construction Site, for the ER's approval. The WMP shall include monthly and yearly Waste Flow Tables that indicate the amounts of waste generated, recycled and disposed of (including final disposal site).	Waste management during construction	Contractors		√		ETWB TCW No. 19/2005, Waste Management on Construction Sites
S.6.6.1	The Contractor's waste management practices and effectiveness shall be audited by the Engineer's Representative on regular basis.	Waste management during construction	DSD		√		Waste Disposal Ordinance
S.6.6.1	The Contractor shall provide training for site staff concept of site cleanliness and appropriate waste management procedures, including waste reduction, reuse and recycling.	Waste management during construction	Contractors		√		Waste Disposal Ordinance
S.6.6.1	Sufficient waste disposal points and regular collection of waste shall be provided.	Waste management during construction	Contractors		√		Waste Disposal Ordinance
S.6.6.1	Trucks with covering for the open-box bed and enclosed container shall be used to minimise windblown litter and dust during transportation of waste.	Waste management during construction	Contractors		√		Waste Disposal Ordinance
S.6.6.1	Regular cleaning and maintenance programme for drainage systems, pumps and oil interceptors.	Waste management during construction	Contractors		√		Waste Disposal Ordinance

EIA Ref.	Recommended Environmental Protection Measures/ Mitigation Measures	Objectives of the recommended measures & main concerns to address	Who to implement the measures?	When to implement the measures?			What requirements or standards for the measures to achieve?
				D	C	O	
S.6.6.1	Separation of chemical wastes for special handling and appropriate treatment at a Chemical Waste Treatment Facility (CWTF).	Waste management during construction	Contractors		√		Waste Disposal (Chemical Waste) (General) Regulation
S.6.6.1	Encourage collection of aluminium cans, paper and plastic bottles by providing separate labelled bins to enable these wastes to be segregated from other general refuse generated by the workforce.	Waste management during construction	Contractors		√		Waste Disposal Ordinance
S.6.6.1	Segregation and storage of different types of waste in different containers, skips or stockpiles to enhance reuse or recycling of materials and their proper disposal.	Waste management during construction	Contractors		√		Waste Disposal Ordinance
S.6.6.1	A recording system for the amount of wastes generated, recycled and disposed (including disposal sites) should be proposed.	Waste management during construction	Contractors		√		Waste Disposal Ordinance
S.6.6.1	Plan and stock construction materials to minimise amount of waste generated and avoid unnecessary generation of waste.	Waste management during construction	Contractors		√		Waste Disposal Ordinance
S.6.6.2	Alternatives C&D materials such as steel frameworks and plastic fencing can be considered to increase the chances for reuse.	Waste management during construction	Contractors		√		Waste Disposal Ordinance
S.6.6.3	In order to minimise the potential environmental impacts resulting from collection and transportation of C&D materials for off-site disposal, the excavated materials comprising fill materials should be reused on-site as backfilling materials as far as practicable.	Waste management during construction	Contractors		√		Waste Disposal Ordinance

EIA Ref.	Recommended Environmental Protection Measures/ Mitigation Measures	Objectives of the recommended measures & main concerns to address	Who to implement the measures?	When to implement the measures?			What requirements or standards for the measures to achieve?
				D	C	O	
S.6.6.4	C&D waste, such as wood, plastic, steel and other metals should be reused or recycled and, as a last resort, disposed of to landfill sites. A suitable area should be designated within the site for temporary stockpiling of C&D materials and to facilitate the sorting process. In order to monitor the disposal of C&D materials at the designated public fill reception facility and landfill and to control fly-tipping, a trip ticket system should be included. Reference can be made to Development Bureau Technical Circular (Works) (TC(W)) No. 6/2010 for details.	Waste management during construction	Contractors		√		Development Bureau Technical Circular (Works) (TC(W)) No. 6/2010,  Waste Disposal Ordinance
S.6.6.5	The C&D materials to be disposed of at public filling reception facilities shall be only materials consist of brick, concrete, cement plaster, soil and inert building debris. The materials shall be free from plastics, chemical waste, industrial metals and other materials that are considered unsuitable at the facility.	Waste management during construction	Contractors		√		Waste Disposal Ordinance
S.6.6.6	General refuse should be stored in enclosed bins or compaction units separate from C&D materials. A reputable waste collector should be employed by the contractor to remove general refuse from the site regularly, separately from C&D materials. An enclosed and covered area is preferred to reduce the occurrence of 'wind blown' light materials. In addition, a sufficient number of enclosed bins shall be provided on site for containment of general refuse to prevent visual impacts and nuisance to the sensitive surrounding.	Waste management during construction	Contractors		√		Waste Disposal Ordinance

EIA Ref.	Recommended Environmental Protection Measures/ Mitigation Measures	Objectives of the recommended measures & main concerns to address	Who to implement the measures?	When to implement the measures?			What requirements or standards for the measures to achieve?
				D	C	O	
S.6.6.7	For the disposal of chemical wastes produced at the construction site, the Contractor is required to register with the EPD as a Chemical Waste Producer and to follow the requirements stated in the Code of Practice on the Packaging, Labelling and Storage of Chemical Wastes. Good quality containers compatible with the chemical wastes should be used. Appropriate labels should be securely attached on each chemical waste container indicating the chemical characteristics of the chemical waste, such as explosives, flammable oxidizing, irritant, toxic, harmful, corrosive, etc. The Contractor shall also use a licensed waste collector engaged to transport and dispose of the chemical wastes in accordance with the Waste Disposal (Chemical Waste) (General) Regulation.	Waste management during construction	Contractors		√		Waste Disposal (Chemical Waste) (General) Regulation
S.6.6.8	Chemical toilets to be provided on-site shall be regularly cleaned and the night-soil collected and transported by a licensed contractor to a Government Sewage Treatment Works facility for disposal.	Waste management during construction	Contractors		√		Waste Disposal Ordinance

EIA Ref.	Recommended Environmental Protection Measures/ Mitigation Measures	Objectives of the recommended measures & main concerns to address	Who to implement the measures?	When to implement the measures?			What requirements or standards for the measures to achieve?
				D	C	O	
<b>Construction Phase (Upgrading Works of Cheung Chau STW (DP Component))</b>							
Table 11.8	Visual Screen/Hoarding  Decorative hoarding or boundary fence for construction sites shall be considered, and designed to be compatible to the surroundings.	To minimise the potential visual impacts	Contractors		√		N/A



EIA Ref.	Recommended Environmental Protection Measures/ Mitigation Measures	Objectives of the recommended measures & main concerns to address	Who to implement the measures?	When to implement the measures?			What requirements or standards for the measures to achieve?
				D	C	O	
Table 11.8	<p>Protection to Existing Trees within Works Areas</p> <p>All existing trees which are not in direct conflict with the proposed works will be retained. The existing trees proposed to be retained shall be properly maintained and protected by means of fencing to prevent vehicular or pedestrian intrusion that may potentially damage tree canopies, trunks and root zones. Detailed tree protection specifications shall be allowed and included in the Contract Specification, which specifying the tree protection requirement, submission and approval system, and tree monitoring system. For trees with high preservation value, individual tree assessments and continuous tree monitoring reports shall be provided by a certified Arborist, Landscape Architect or related professional during construction. All retained trees shall be recorded photographically at the commencement of contract.</p> <p>Root pruning to the retained trees should be prohibited. Retained trees should be well-preserved by setting up a tree protection zone throughout the construction period for protecting the retained trees from damages.</p> <p>To maximize protection to existing trees and ground vegetation, construction contracts may designate “No-intrusion Zone” to various areas within the site boundary with rigid and durable fencing for each individual no-intrusion zone. The contractor should close monitor and restrict the site working staff not to enter the “no-intrusion zone”, even for non-direct construction activities and storage of equipment.</p>	Landscape mitigation measures	DSD and Contractors	√	√		EIA, Annex 10 and Annex 18 of EIAO-TM

EIA Ref.	Recommended Environmental Protection Measures/ Mitigation Measures	Objectives of the recommended measures & main concerns to address	Who to implement the measures?	When to implement the measures?			What requirements or standards for the measures to achieve?
				D	C	O	
Table 11.8	<p>Tree Transplanting</p> <p>Existing trees to be affected shall be directly transplanted to the proposed tree receiving sites, or to temporary tree nurseries alternatively. Temporary tree nurseries may be set up for the transplanted tree and proposed trees at an early stage to allow small trees to grow during the construction stage. By the time when planting area becomes available, trees have been mature and required minimal pruning and suffer much less damage during transplanting. The construction programme should also allow sufficient time for root pruning and root ball preparation prior to transplanting, if necessary, and transplanting operations to be carried out in planting season.</p> <p>Tree pruning such as topping, lion tailing would be prohibited as far as possible. Also, frequent keep watering would be necessary for transplanting trees. The proposed tree preservation measures during construction would be carried out and approved by the competent persons.</p>	Landscape mitigation measures	DSD and Contractors	√	√		EIA, Annex 10 and Annex 18 of EIAO-TM
Table 11.8	<p>Construction Light</p> <p>Security floodlight for construction areas shall be controlled, such as equipped with adjustable shield, frosted diffusers and reflective covers, at night to avoid excessive glare to the nearby areas and residents. Other security measures shall also be considered to minimize the visual impacts by construction light.</p>	To reduce the night-time glare effect to the surrounding environs.	Contractors		√		EIA, Annex 10 and Annex 18 of EIAO-TM

EIA Ref.	Recommended Environmental Protection Measures/ Mitigation Measures	Objectives of the recommended measures & main concerns to address	Who to implement the measures?	When to implement the measures?			What requirements or standards for the measures to achieve?
				D	C	O	
Table 11.8	Dust and Erosion Control for Exposed Soil Excavation works and demolition of existing building blocks shall be well planned with precautions to suppress dust. Exposed soil shall be covered or watered often. Areas that are expected to be left with bare soil for a long period of time after excavation shall be properly covered with suitable protective fabric. Suitable drainage shall be provided around construction sites to avoid discharge of contaminants and sediments into sensitive water-based habitats.	To minimise the disturbance to existing landscape resources and minimise the impacts on the visual amenity of the area	Contractors		√		EIA, Annex 10 and Annex 18 of EIAO-TM
Table 11.8	Reinstatement of Works Areas The affected works areas shall be properly reinstated to the satisfaction of relevant government departments.	Landscape mitigation measures	Contractors		√		EIA, Annex 10 and Annex 18 of EIAO-TM

# APPENDIX H

## Summary of All Complaints Received, Notification of Summons and Successful Prosecutions

Statistical Summary of Environmental Complaints

Reporting Period	Environmental Complaints Statistics		
	Frequency	Nature	Follow-up Actions
1 December 2022 - 31 December 2022	0	N/A	N/A
Cumulative	0	N/A	N/A

Statistical Summary of Environmental Summons

Reporting Period	Environmental Summons Statistics		
	Frequency	Nature	Follow-up Actions
1 December 2022 - 31 December 2022	0	N/A	N/A
Cumulative	0	N/A	N/A

Statistical Summary of Environmental Prosecution

Reporting Period	Environmental Prosecution Statistics		
	Frequency	Nature	Follow-up Actions
1 December 2022 - 31 December 2022	0	N/A	N/A
Cumulative	0	N/A	N/A

## APPENDIX I

# EM&A Monitoring Schedules in the Reporting Period and the Next Reporting Period (Tentative)

Contract No. DC/2019/07  
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Impact Monitoring Schedule for Upgrading of Cheung Chau Sewage Collection, Treatment and Disposal Facilities						
Dec-22						
Sun	Mon	Tue	Wed	Thu	Fri	Sat
				1	2	3
	24-hour TSP monitoring for A1a & A2a 1-hour TSP monitoring for A1a & A2a	Daytime Noise monitoring for N2a & N3a				
4	5	6	7	8	9	10
	24-hour TSP monitoring for A1a & A2a 1-hour TSP monitoring for A1a & A2a	Daytime Noise monitoring for N2a & N3a				
11	12	13	14	15	16	17
	24-hour TSP monitoring for A1a & A2a 1-hour TSP monitoring for A1a & A2a	Daytime Noise monitoring for N2a & N3a				
18	19	20	21	22	23	24
	24-hour TSP monitoring for A1a & A2a 1-hour TSP monitoring for A1a & A2a	Daytime Noise monitoring for N2a & N3a		24-hour TSP monitoring for A1a & A2a 1-hour TSP monitoring for A1a & A2a		
25	26	27	28	29	30	31
				24-hour TSP monitoring for A1a & A2a 1-hour TSP monitoring for A1a & A2a	Daytime Noise monitoring for N2a & N3a	

Remarks:

- Daytime Noise Monitoring (07:00-1900)

Impact Monitoring Schedule for Upgrading of Cheung Chau Sewage Collection, Treatment and Disposal Facilities						
Jan-23						
Sun	Mon	Tue	Wed	Thu	Fri	Sat
1	2	3	4	5	6	7
			24-hour TSP monitoring for A1a 1-hour TSP monitoring for A1a & A2a	24-hour TSP monitoring for A2a Daytime Noise monitoring for N2a & N3a		



