









Atkins China Limited Chief Resident Engineer's Office No. 17 Cheung Chau Sai Tai Road Cheung Chau, New Territories Hong Kong

Attn: Ir. Tony C.W. Chik – Chief Resident Engineer

Your Reference	Contract No. CM 04/2021				
<b>Our Reference</b> AFK/EC/TC/LL/kl/	Independent Environmental Checker for Environmental Monitoring Works for Upgrading of Cheung Chau Sewage Treatment and Disposal Facilities				
T601424122/L040	Environmental Permit No. EP-488/2014/A				
Mott MacDonald	Monthly EM&A Report for October 2022 (Rev. 1)				
3/F Manulife Tower 348 Kwun Tong Road Kwun Tong Kowloon	11 November 2022 <b>By Email</b>				
	Dear Sir,				
T +852 2828 5757 F +852 2827 1823 mottmac.hk	I refer to the Monthly EM&A Report for October 2022 (Rev. 1) under the captioned Project, which was certified on 10 November 2022 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				

Liz Lo Independent Environmental Checker T +852 2828 5751 Liz.Lo@mottmac.com

Encl.

c.c. DSD Atkins China Limited

> Acuity Sustainability Consulting Limited Build King Civil Engineering Limited

Ir. Ng Chi Kin, Bill Ir. Dennis Cheung / Ir. Winnie Choi Mr. Kevin Li Mr. Alvin Lei / Mr. Lawrence Lam By Email By Email

By Email By Email

Mott MacDonald Hong Kong Limited registered in Hong Kong no. 236497







# aurecon

Our Ref.: PL-202211020

Environmental Protection Department Environmental Assessment Division Regional Assessment Group Lantau South, Lamma, Cheung Chau & Tsing Yi Section (5) 27th floor, Southorn Centre, 130 Hennessy Road, Wan Chai, Hong Kong

Attention: Ms. Flora NG

14 November 2022

Dear Flora,

Contract No. DC/2019/07 Outlaying Islands Sewerage Stage 2 – Upgrading of Cheung Chau Sewage Treatment and Disposal Facilities Monthly EM&A Report for October 2022

According to Condition 4.4 under Environmental Permit No.: EP-488/2014/A, on behalf of the Drainage Services Department (the Permit Holder), we are pleased to submit herewith the October 2022 Monthly EM&A Report (Rev. 1), which is certified by the Environmental Team Leader (Acuity Sustainability Consulting Limited) and verified by the Independent Environmental Checker (Mott Macdonald Hong Kong Limited) for your record.

Should you have any queries, please do not hesitate to contact the Permit Holder's Engineer Mr. Ng Chi Kin, Bill at 2594 7264.

Yours faithfully,

Kevin W.M. Li Environmental Team Leader c.c. DSD Attn: Mr. Bill Ng 1 hard copy (by hand) Atkins Attn: Mr. Dennis Cheung 1 hard copy (by hand) 1 hard copy (by hand) Build King Attn: Mr. Alvin Lei Mott MacDonald (IEC) Attn: Ms. Liz Lo 1 e copy (by email) Acuity Sustainability Consulting Limited | tel +852 2698 6833

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Contract No. DC/2019/07

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

## 15th Monthly Environmental Monitoring and Audit Report -October 2022

Document No.						
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### **REVISION HISTORY**

Rev.	<b>Description of Modification</b>	DATE
0	First Issue for Comments	8 November 2022
1	Updated according to IEC's comments	10 November 2022

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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 15<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 October to 31 October 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
  - 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
  - Demolition of Existing Sludge Digestion System
- 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 Four (4) 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.

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A.9 Results of the monitoring for air quality and airborne noise are given in **Table A** and **Table B** as follows:

		Dust in μg/m <sup>3</sup>		
Location	Average		Range	
	TSP-1hr	TSP-24hr	TSP-1hr	TSP-24hr
A1a	69	67	57 - 78	35 - 87
A2a	62	62	56 - 68	51 - 77

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

\*Remark: For A2a, the monitoring day of 06/10/2022 was changed to 08/10/2022 due to mechanical failure of the High Volume samplers.

#### 

	Noise in	n dB(A)
Location	Average	Range
	L <sub>eq (30 min)</sub> (7:00-19:00)	L <sub>eq (30 min)</sub> (7:00-19:00)
N2a	71.8	65.9 – 73.8
N3a	68.8	64.1 - 71.8

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 05, 11, 18 and 24 October 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 <u>Appendix A</u>.
- A.18 The summary of permit / licences for this Project is presented in **Table C** below:

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

#### Table C - Summary of Permit / Licences

#### **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).

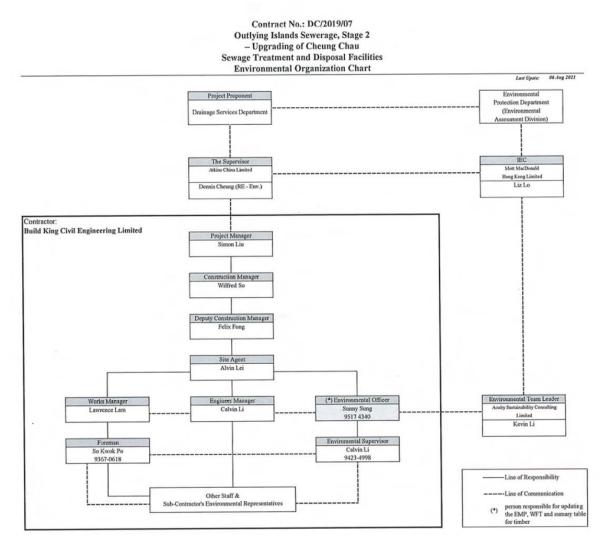
#### **1.2. PROJECT DESCRIPTION**

- 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**.





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 Environmental Officer	Alvin Lei Sunny Sung	6123 8136 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
- 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
- Demolition of Existing Sludge Digestion System

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
- Demolition of Existing Sludge Digestion System

#### **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 October to 31 October 2022.

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#### 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)  $0.6 1.7 \text{ m}^3$  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

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(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**.

Equipment	Model	Serial Number
Portable dust meter – 1-hour TSP	SIBATA Digital Dust Indicator (Model: LD-5R)	761173 992820 992821
High Volume Samplers –	Tisch TE-5170X High Volume	1048
24- hour TSP	Air Sampler	1085
Calibrator Kit	Tisch TE-5025A Calibration Kit	3465

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#### **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.

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 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

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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.

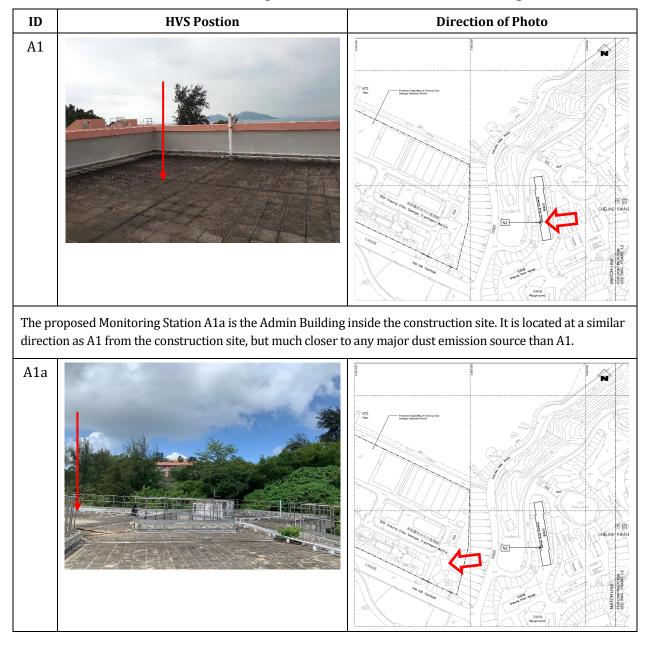
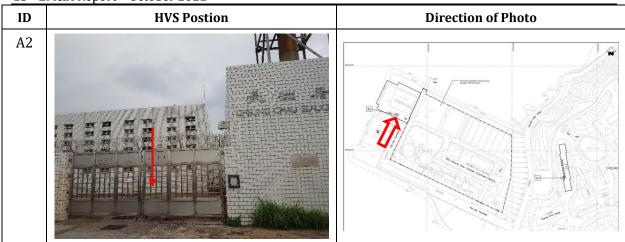


 Table 2.3 Photo of Proposed HVS Position at Dust Monitoring Stations



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



#### **2.5. RESULTS AND ANALYSIS**

2.5.1. The 1-hour TSP and 24-hour TSP measurement data are shown in <u>Appendix D</u> and summarized in **Table 2.4** and **Table 2.5** respectively.

Table 2.4	Summary of 1-hour TSP Monitoring Results
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Monitoring Location	Average(µg/m3)	Range(µg/m3)
A1a	69	57 - 78
A2a	62	56 - 68

Monitoring Location	Average(µg/m3)	Range(µg/m3)
A1a	67	35 - 87
A2a	62	51 - 77

\*Remark: For A2a, the monitoring day of 06/10/2022 was changed to 08/10/2022 due to mechanical failure of the High Volume samplers.

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#### **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.

Parameters	Action Level	Limit Level
1-hour TSP Level	For baseline level $\leq 200 \ \mu g/m^3$ AL = (BL * 1.3 + LL)/2	260 μg/m <sup>3</sup>
in μg/m <sup>3</sup>	<u>For baseline level &gt; 200 μg/m³</u> AL = LL	
24-hour TSP Level in	For baseline level $\leq 384 \ \mu g/m^3$ AL = (BL * 1.3 + LL)/2	500 μg/m <sup>3</sup>
μg/m³	<u>For baseline level &gt; 384 μg/m<sup>3</sup></u> AL = LL	

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

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	<b>Action Level</b> µg/m <sup>3</sup>	<b>Limit Level</b> µg/m <sup>3</sup>
1-hour TSP Level	A1a	151	260
in µg/m <sup>3</sup>	A2a	154	
24-hour TSP Level in	A1a	270	500
μg/m <sup>3</sup>	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)

EVENT		A
	ET	
Exceedance for one sample	<ol> <li>Identify source, investigate the causes of exceedance and propose remedial measures;</li> <li>Inform IEC and ER;</li> <li>Repeat measurement to confirm finding; and</li> <li>Increase monitoring frequency to daily.</li> </ol>	<ol> <li>Check m by ET; an</li> <li>Check C method.</li> </ol>
Exceedance for two or more consecutive samples	<ol> <li>Identify source;</li> <li>Inform IEC and ER;</li> <li>Advise the ER on the effectiveness of the proposed remedial measures;</li> <li>Repeat measurements to confirm findings;</li> <li>Increase monitoring frequency to daily;</li> <li>Discuss with IEC and Contractor on remedial actions required;</li> <li>If exceedance continues, arrange meeting with IEC and ER; and</li> <li>If exceedance stops, cease additional monitoring.</li> </ol>	<ol> <li>Check ma ET;</li> <li>Check Co method;</li> <li>Discuss w possible r</li> <li>Advise the of the prop and</li> <li>Supervise remedial r</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 $L_{eq 5min}/L_{eq 30min}$ (average of 6 consecutive $L_{eq}$ 5min)	L <sub>eq 5min</sub> , L <sub>eq 30min</sub> , 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 <u>Appendix E</u>.

Equipment	Model	Serial Number
Sound Level Meter	SVANTEK 971	96062
Acoustic Calibrator	Rion NC-75	34724244

Table 3.2 Equipment Used for Noise Monitoring

#### **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.

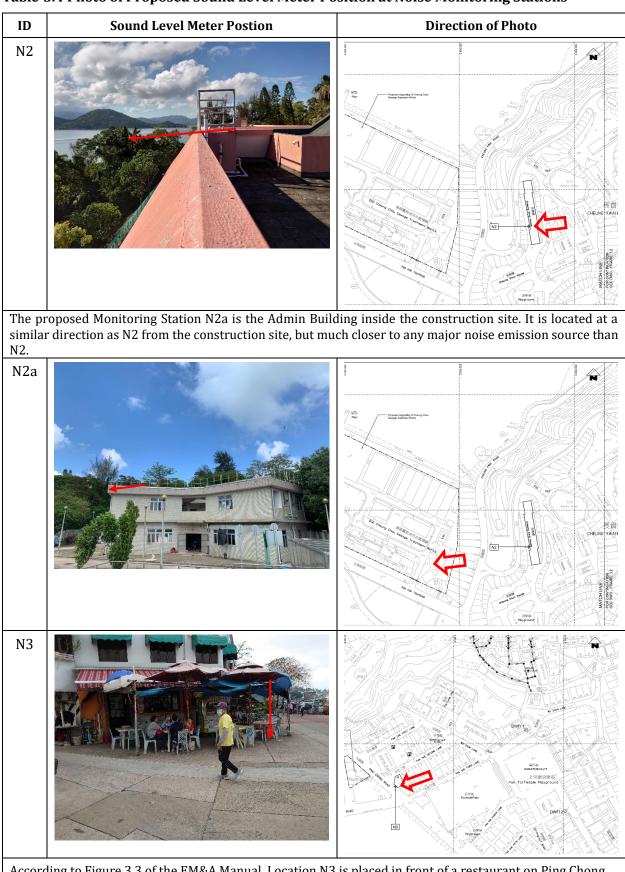
 Table 3.3 Noise Monitoring Stations for Noise Monitoring

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ID No.	Location	Nature of Uses	Remarks	Façade/Free- field
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 Secion 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



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.

22

ID	Sound Level Meter Postion	Direction of Photo
N3a		A Constrained of the second of

#### **3.4. RESULTS AND ANALYSIS**

3.4.1. The noise monitoring was carried out in October 2022. The measurement data are shown in <u>Appendix F</u> and summarized in **Tables 3.5**.

Monitoring Location	Time Period	Average[dB(A))	Range[dB(A))
N2a	Daytime (0700- 1900)	71.8	65.9 - 73.8
N3a	Daytime (0700- 1900)	68.8	64.1 - 71.8

#### Table 3.5 Summary of Noise Monitoring Results

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.

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Event	ET	IEC	ER	CONTRACTOR
Action Level	<ol> <li>Notify ER, IEC and Contractor;</li> <li>Carry out investigation;</li> <li>Report the results of investigation to the IEC, ER and Contractor;</li> <li>Discuss with the IEC and contractor and formulate remedial measures; and</li> <li>Increase monitoring frequency to check the effectiveness of mitigation measures.</li> </ol>	<ol> <li>Review the investigation results submitted by the ET;</li> <li>Review the proposed remedial measures by the Contractor and advise the ER accordingly; and</li> <li>Advise the ER on the effectiveness of the proposed remedial measures.</li> </ol>	<ol> <li>Confirm receipt of notification of failure in writing;</li> <li>Notify Contractor;</li> <li>In consolidation with the IEC, agree with the Contractor on the remedial measures to be implemented; and</li> <li>Supervise the implementation of remedial measures.</li> </ol>	<ol> <li>Submit noise mitigation proposals to IEC and ER; and</li> <li>Implement noise mitigation proposals.</li> </ol>
Limit Level	<ol> <li>Notify IEC, ER, EPD &amp; Contractor;</li> <li>Identify source and investigate the cause of exceedance;</li> <li>Repeat measurement to confirm findings;</li> <li>Increase monitoring frequency;</li> <li>Carry out analysis of Contractor's working procedures to determine possible mitigation to be implemented;</li> <li>Discuss with the IEC, Contractor and ER on remedial measures required;</li> <li>Assess the effectiveness of Contractor's remedial actions and keep IEC, EPD and ER informed of the results; and</li> <li>If exceedance stops, cease additional monitoring.</li> </ol>	<ol> <li>Discuss amongst ER, ER and Contractor on the potential remedial actions; and</li> <li>Review Contractor's remedial actions whenever necessary to assure their effectiveness and advise the ER accordingly.</li> </ol>	<ol> <li>Confirm receipt of notification of failure in writing;</li> <li>Notify Contractor;</li> <li>In consolidation with the EIC, agree with the Contractor on the remedial measures to be implemented;</li> <li>Supervise the implementation of remedial measures; and</li> <li>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> <li>Take immediate action to avoid further exceedance;</li> <li>Submit proposals for remedial actions to IEC and ER within 3 working days of notification;</li> <li>Implement the agreed proposals;</li> <li>Submit further proposal if problem still not under control; and</li> <li>Stop the relevant portion of works as determined by ER, until the exceedance is abated.</li> </ol>

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

#### 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 05, 11, 18 and 24 October 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 on 11 October 2022 for testing. The quality of the discharge complied with the requirements of the discharge licence.

#### 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**.



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)

(All quantities s	hall be rounded off to	3 decimal places)								updated on:	03-Oct-2022
		Actual Quan	tities of Inert C&D Mater	ials Generated / Imported	(in '000 kg)			Actual Quantities	of Other C&D Materials /	Wastes Generated	
Month	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 package material)	Chemical Waste (h)	Others (i) (e.g. General Refuse etc.)
	[a+b+c+d+c+f+g+h+i)	(a)	(b)	(c)	(d)		(c) (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	0.0000	1.5200
Feb-2022	1.3800	0.0000	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	0.0000	0.9600
Apr-2022	1357.0800	0.0000	0.0000	0.0000	1353.9000	0.0000	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	0.0000	3.2200
Jun-2022	1319.8900	0.0000	0.0000	0.0000	1313.0000	0.0000	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	0.0000	17.1500
Jul-2022	3144.6400	0.0000	0.0000	0.0000	3140.0000	0.0000	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	0.0000	5.2200
Sep-2022	4.3700	0.0000	0.0000	0.0000	3.7300	0.0000	0.0000	0.0000	0.0000	0.0000	0.6400
Oct-2022	2.4000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	2.4000
Nov-2022											
Dec-2022											
Yearly Total	13404.1500	0.0000	0.0000	0.0000	13374.1000	0.0000	0.0000	0.0000	0.0000	0.0000	30.0500

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

		Actual Quan	tities of Inert C&D Mater	ials Generated / Imported	Actual Quantities of Other C&D Materials / Wastes Generated							
Year	Total Quantities Generated	Broken Concrete (including rock for recycling into nggregates)	Reused in the Contract	Reused in Other Projects	Disposed as Public Fill	Imported C&D Material	Metal	Paper/ Cardboard Packaging	Plastic (bottles/containers, plastic sbeets/ foams from package material)	Chemical Waste	Others (e.g. General Refuse etc.)	
	[a+b+c+d+c+f+g+h+i)	(a)	(b)	(c)	(d)		(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	0.0000	
2021	858.3600	0.0000	0.0000	0.0000	786.3000	0.0000	0.0000	0.0000	0.0000	0.0000	72.0600	
2022	13404.1500	0.0000	0.0000	0.0000	13374.1000	0.0000	0.0000	0.0000	0.0000	0.0000	30.0500	
2023	0.0000											
2024	0.0000											
2025	0.0000											
2026	0.0000											
Total	14262.5100	0.0000	0.0000	0.0000	14160.4000	0.0000	0.0000	0.0000	0.0000	0.0000	102.1100	

Remark:

Density of C&D material to be
 Density of General Refuse to be

0.88 metric ton/m3

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.

metric ton/m3

metric ton/m3

(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)

1.6

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3) Density of Chemical Waste to be

#### 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.

#### **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 05, 11, 18 and 24 October 2022. A joint site inspection with IEC was carried out on 24 October 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**.

Date	Environmental Observations	Follow-up Status	Reminders
5 October 2022	NIL	NA	At SDB, the sandbag should be in good condition.
11 October 2022	NIL	NA	Coverexposedstockpileswithimpervioussheets toavoiddustgeneration.
18 October 2022	NIL	NA	At LV main switch room & SDB, the sandbag sould be maintained in good condition.
24 October 2022	At transformer room area, retained trees should be well fenced off.	Retained trees has been provided tree protection zone area.	

Table 7.1 Site Observations

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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**.

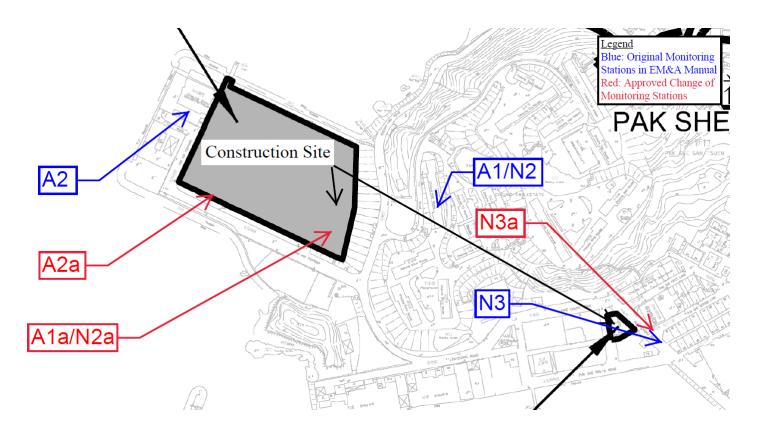
### **7.4**.

### **8.** CONCLUSION

- 8.1. This is the 15<sup>th</sup> Monthly EM&A Report for the Project which summarizes the key findings of the programme during the reporting period from 1 October to 31 October 2022, in accordance with the EM&A Manual and the requirement under EP-488/2014/A.
- 8.2. Four (4) 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





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## APPENDIX B Construction Programme



-	ADNEY RAFIS	Of, Dur (d)	16A (d) 1	ine Elapsed %	Actual Workdone %	Actual Start	Actual Finish	Early Start	Early Finish	Late Start	Life Finish	Early Start (Rev.17)	Early Finish (Rex.17)	Amended Total Activities Filsat	OJE 44	2021 1.1.1.4.9 C N	207 DJFI44 JJ	ASOND	A J JASOND	JENNANJASO	NUTRENT	SCHOLENA
JTLYING ISI	ANDS SEWERAGE STAGE2 - UPGRADING OF CHEUNG CHAU SEWAG	SE TREAT	MEI	30,19%		27-1404-20		27-Nov-20 A	01-Jan-27	30-5qp-22	01-Jan-27	27-Nov-20	01-Jin-27	0								
EY DATES				100%		27-Nov-20		20410042074	28-0eo-25	28-Dec-25	28-066-25	2211004120	28-046-25	0	27-Nov-2							
C KD 1020	Contract Starting Date Contract Completion Date	0	0	100%	130%	27-Nov-20		27-Nov-20 A	28-Dec-25*		28-Dec-25	27-Nov-20	28-Dep-25		27-1107-2	0A						
CESS DATE	Comaci Competion Date	U	0	100%	0%	27.3691/20	29-1-0-25	27.5/m-20.4	25-060-25		201080425	27.3394-20	254080425	0								11
CKD 1080	Puttion A.B. C. D.F. Fand Works Area WA1	0	0	102%	1005	27-1kw-20	0000000	27-Nov-20 A	004204010			27-Nov-20	00-00-00		27-10-2	04			·			
C KD 1080a	Works Area WA2	0	0	100%		27-Nov-20		274\0+20 A				27-Nov-20			27-No+2							
C.KD.1040	Works Area WA3	0	0	100%		03-Jun-21		03-Jun-21 A				03-Jun-21				\$ 13-Jan-2						
ANNED CO	MPLETION DATES							29-May-21 A	10-0:425	22-Feb-23	10-0:1-25	29-Min-21	02-0:1-25	0		-						÷ 1
CKD.1060	Planned Completion of Section 1 (Actual Commencement Date on 27 Nov 2020)	0	0				29-May-21		29-May-21 A				29-May-21									
C.KD,1060	Planned Completion of Section 2 (Actual Commencement Date on 29 May 2021)	0	0						22-Feb-23*				22-Feb-23	0				1 8				
CKD.1070	Planned Completion of Section 3 (Actual Commencement Date on 29 May 2021)	0	0						13-Jan-25*				02-/pr-25	• 0	11			N S			•	
KD.1083	Planned Completion of Section 4 (Actual Commencement Date on 29 May 2021)	0	0						10-Oc1-25*				02-Oct-25	· 0				r				8
DNTRACT SE	ECTIONAL COMPLETION DATES							29-May-21 A	02-Jan-25	00-Dec-22	03-Jan-25	28-Feb-22	03-Jan-26	0								_
C.KD,1230	Contract Sectional Completion Date of Section 1 (Actual Commencement Date on 27 Nov 2023)	0	0	100%			29-May-21		29-May-21 A				29-May-21			•	•					
CKD.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	0				\$				
C.KD.1260	Contract Sectional Completion Date of Section 3 (Actual Commencement Date on 29 May 2021)	0	0	34,9%					02-4pr-25*				02-Apr-25	0							\$	
C.KD.1270	Contract Sectional Completion Date of Section 4 (Actual Commencement Date on 29 May 2021)	0	0	29.2%					02-Jan-26*				02-Jan-26	0								•
ESIGN SUBN	ISSION, PERMIT			69.92%		27-Wox-20		274Voi+20 A	02-34-25	14-Feb-24	10-001-25	27-Nov-20	19-Sep-25	100								
C.KD.1090	Preparetubmission of Temporary Drainage and Sewarage Management Plan to the Supervisor, DSDNK&	106	0	100%	100%	27-Nov-20	12-Mar-21	27-Nor-20 A	12-Mir-21 A			27-Nov-20	12-Mer-21		<b>—</b>							
C.KD.1100 C.KD.1110	Consultation/approval of Temporary Drainage and Severage Management Plan by the Supervisor, DSD H+		0	100%	130%	13-Mai-21 27-Nov-20	11-May-21 15-May-21	13-Mar-21 A 27-Nov-20 A	11-May-21 A 15-May-21 A			13-Mar-21 27-Nov-20	11-May-21 15-May-21				111					
C KD.1110 C KD.1120	Application/approval of MEN & seeking Marine Depts approval for load right/coding at passage area rear Application/approval of TTMS and CNP for right works by relevant authorities	170	0	100%	100%	27-Nov-20 27-Nov-20	15-May-21 15-May-21	27-Nov-20 A 27-Nov-20 A	15-May-21 A 15-May-21 A			27-Nov-20 27-Nov-20	15-May-21 15-May-21									
CKD.1120 CKD.1130		1/0	0	100%	130%	27-Nov-20 27-Nov-20	15-May-21 25-Apt-21	27-Noi-20 A 27-Noi-20 A	15-May-21 A 25-Act-21 A			27-Nov-20 27-Nov-20	15-May-21 25-Apr-21				111					
CKD 1140		30	0	100%	100%	27-Nov-20	26-Dec-20	27-N06-20 A	25-90-21 A 26-Dep-20 A			27-Nov-20 27-Nov-20	254ps-21 26Dep-20									
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C.KD.1160		25	0	0%	0%			14-Apr-25	(8-May-25	18-Sep-25	10-0:1-25	02-34-25	25-34-25	155	11						•	
CKD.1170		200	0	0%	0%			15-Dec-24		25-Mar-25	10-0c1-25	04-Mar-25	19-Sep-25	100	1			J				411
C,KD,1180		14	0	100%	100%	27-Nov-20	10-0ec-20	27-Nov-20 A	10-Dec-20.A			27-Nov-20	10-Dec-20		1							
C.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		1		111					
C.KD.1200	Preparation and Submission of Salety 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									
C,KD,1210	Preparation and Submission of Tree Survey Report	111	0	100%	100%	27-Nov-20	17-Mor-21	27-Nov-20 A	17-Mor-21 A			27-Nov-20	17-Mar-21									
C.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						1		
ECTION 1				100%		27-Nov-20	18-Nov-21	274Voi+20 A	184Nov-21 A			27-Nov-20	184Nov-21									
	ROPOSAL for ECI Stage 2			100%		27-Nov-20	18-Nov-21	27-Nov-20 A	18-Nov-21 A			27-Nov-20	18-Nov-21									
	osal for Preliminary Treatment System at CCSTW			100%		03-Jun-21	18-Nov-21	03-Jun-21 A	18-Nov-21 A			03-Jun-21	18-Nov-21									
DC.S1.1010	- released a subbrane of a state shifts	10	0	100%	100%	03-Jun-21	12-Jun-21	03-Jun-21 A	12-Jun-21 A			03-Jun-21	12-Jun-21			1.						
DC.S1.1020 DC.S1.1030		25 25	0	100%	100%	13-Jun-21	07-Jul-21	13-Jun-21 A	07-JU421 A			13-Jun-21	07-Jul-21			1.1						
DC.51.1030 DC.S1.1040		20	0	100%	130%	08-Jul-21 02-Aug-21	01-Aup-21 21-Aup-21	08-Jul-21 A 02-Aug-21 A	01-Aug-21 A 21-Aug-21 A			08-Jul-21 02-Aug-21	01-Aug-21 21-Aug-21			G. L.						
DC S1.1040	Preparation or general layout and equipment location plant Preparation of control philosophy	20	0	100%	1005	22-Aug-21	21-74g-21 30-Aug-21	22-Aug-21 A	21-9402-21 A 30-Aug-21 A			22-Aug-21	21-Plug-21 30-Plug-21						j			
DC.S1.1060		19	0	100%	100%	31-Aup-21	18-Sop-21	31-Aup-21 A	18-Sep-21A			31-Aug-21	18-Sop-21									
DC.S1.1070	Draf Submission	0	0	100%	100%	o magai	18-Sep-21	onregain	18-Sep-21A		-	struger	18-Sep-21									
DC.S1.1080		27	0	100%	100%	19-Sep-21	15-Oct-21	19-Seo-21 A	15-0cl-21 A			19-Sep-21	15-0x1-21			1.						
DC.S1.1090	Final Submission	34	0	100%	100%	16-0:1-21	18-Nov-21	16-0x8-21 A	18-Nov-21 A			16-Oct-21	18-Nov-21			-						
lechnical Prop	osal for MBR System and MBR Building at CCSTW			100%		27-Nov-20	25-May-21	27-Nov-20 A	25-May-21 A			27-Nov-20	25-May-21			·						
E&M Submission				100%		27-Nov-20	25-May-21	27-Noi-20 A	25-May-21 A			27-Nov-20	25-May-21		H							
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00,61,1260	Preparation of remaining content of technical prosposal	19	0	100%	100%	07-Mar-21	25-Mai-21	07-Mar-21 A	25-Mer-21 A			07-Mor-21	25-Mer-21		1							
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	maining Work tical Remaining Work									(Page 1 d	of 10)							ľ	30-Sep-22	Rev.18	JL	. CL



10	Activity Name	Ori, Dur (d)	TRA (d)	ine Bapsed %	Actual	Actual Start	Actual Finish	Early Start	Early Finish Lale Start	Late Fivish	Early Start	Early Finish Amended (Brid 17) Artistics	Total	2021 FINANALASCINOTIFINA TITANA	2023		NN ANN A CARDONN	2025 21 and 2 d a 2	2026
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chnical Prop	posal for Electrical Works at CCSTW			100%		27-Nov-20	25-May-21	27-Nov-20 A	25-May-21.A		27-Nov-20	25-May-21							
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schnical Proc	posal for Temp, Works Design for the 1st 3months of ECI S2	34	0	100%	100%	22-495-21	25-May-21 23-May-21	22-Apt-21 A 16-Jan-21 A	25-Maj-21 A 23-Mai-21 A		22-Apt-21 16-Jan-21	25-898y-21		<u> </u>					
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C S1 1410b	Preparation and approval of Technical Preposal for ELS Design of LV/Main Switch Rm, Transformer Rm &	67	0	100%	100%	16-Jap-21	23-Mar-21	16-Jan-21 A	23-Mai-21 A		16-Jan-21	23-Mar-21							
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0C.S1.1410d	Preparation and approval of Technical Proposal for ELS of 750mm dameter emergency bypass diversion a	67	0	100%	100%	16-Jan-21	23-Mar-21	16-Jan-21 A	23-Mai-21 A		16-Jan-21	23Mar-21							
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echnical Prop	posal for Accommodation for the Project Manager's, Supervisor's & Contractor's Co-Offic	ce		100%		27-Nov-20	25-Mar-21	27-Noi-20 A	25-Mai+21 A		27-Nov-20	25-Mar-21					-0		
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chnical Prop	posal for DfMA including application of prefabrication and MiC			100%		26-Jan-21	29-Jun-21	26-Jan-21 A	29-Jun-21.A		26-Jan-21	29-Jun-21	-						
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TE PREPAR	ATION WORKS			100%		274kev-20	15-May-21	27-Noi-20 A	15-May-21 A		27-Nor-20	15-May-21							
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DC.S1.1610b	Submit Report of Initial Reconnaissance Visit	5	0	100%	100%	11-Deo-20	15-Dec-20	11-Dec-20 A	15-Deo-20 A		11-Dec-20	15-Deo-20							
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DC,S1.1610d	Preparation work for Raw Sewage Sampling	7	0	100%	100%	23-Dec-20	29-Dec-20	23-Dec-20 A	29-Dec-20 A		23-Dec-20	29-Dec-20							
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C.S2.10059 C.S2.1005h C.S2.1005h C.S2.1010a C.S2.1010a C.S2.1010a C.S2.1010a C.S2.1010a C.S2.1010a C.S2.1010a C.S2.1010a C.S2.1010a C.S2.1010a C.S2.1010a C.S2.1010a C.S2.1010a C.S2.1010a C.S2.10059 C.S2.10059 C.S2.1005h C.S2.1010a C.S2.1000A C.S2.1000A C.S2.1000A C.S2.1000A C.S2.1000A C.S2.1000A C.S2.1000A C.S2.1000A C.S2.1000A C.S2.1000A C.S2.1000A C.S2.1000A C.S2.100A	Caperor Stanson un Argend //PK Cover Stars Parg Experter Stanson un Argend //PK I Insuante (Cover Argent) Insuante (Cover Argent) Insuante (Vestöd) Insuante (Vestöd) Insuante (Sover Stat)	127 35 7 2	0 0 0 0	100% 100% 100%	100% 100% 100%	24-Sep-21 03-Jan-22 20-Mar-22	24-Sep-21 D4-Jan-22 21-Mar-22 NDS SEWER	03-Jan-22 A 20-Mai-22 A	04-Jan-22 A 21-Man-22 A 22 - UPGRADING OF	CHEUNG CH/ V. 18 (30 Se	17-Mar-21 20-Mar-22 AU SEW	18-Mar-21 21-Mar-22	AND DI	SPOSAL FACILITIES	31-Au	ug-22	Rev.17	n Chec. JL JL	AL

## APPENDIX C Calibration Certificates

## (Air Monitoring)



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

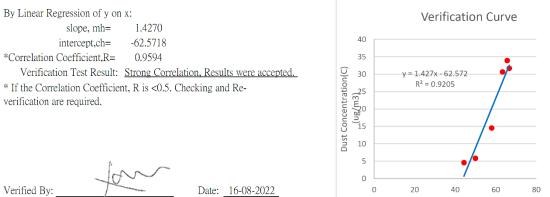
Verification Test Date:	27-Mar-22	to	3-Apr-22
Next Verification Test Date:	4-Apr-23		
Unit-under-Test- Model No.	Sibata LD-5R		
Unit-under-Test Serial No.	761173		
Our Report Refrence No.	RPT-22-HVS-00	11	

Standard Equipment Information			
Verification Equipment Type		Tisch' s	Tish HVS
vermeation Equipment Type		TSP HVS	Calibrator
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	Date		Time		K-Factor	Counts/ Minute (R)	Total Counts	TSP Sample	Dust Concentration (ug/m3), (C)
Test No.		Start-time	End-time	Elapsed Time (in min)	K-Factor (K=C/R)	x-axis	(TC)	ID No.	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
					0.00033				

0.3

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



Field Supervisor

Date: 16-08-2022

Count/Minute (R)



#### 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.	992820		
Our Report Refrence No.	RPT-22-HVS-00	04	

Standard Equipment Information									
Verification Equipment Type		Tisch's TSP	Tish HVS						
Vernication Equipment Type		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	Counts/ Minute (R)	Total Counts	TSP Sample	Dust Concentration (ug/m3), (C)	
		Start-time	End-time	Elapsed Time (in min)	K-Factor (K=C/R)	x-axis	(TC)	ID No.	y axis
1	27/3/2022	4945.81	4949.09	196.80	0.00083	61	12005	R220486/1	50
2	27/3/2022	4949.09	4952.83	224.40	0.00082	65	14586	R220486/2	53
3	27/3/2022	4952.83	4956.42	215.40	0.00081	58	12493	R220486/3	47
4	3/4/2022	4991.80	4995.40	216.00	0.00047	48	10296	R220538/1	22
5	3/4/2022	4995.40	4998.79	203.40	0.00047	50	10102	R220538/2	23
6	3/4/2022	4998.79	5002.26	208.20	0.00067	56	11590	R220538/3	37
					0.00068				

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

By Linear Regression of y on x:

slope, mh= 2.0047

intercept,ch= -73.6384

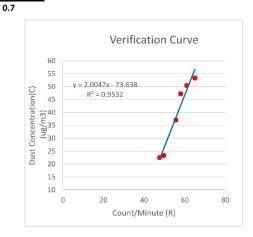
\*Correlation Coefficient,R= 0.9763

Verification Test Result: <u>Strong Correlation, Results were accepted.</u> \* If the Correlation Coefficient, R is <0.5. Checking and Re-

verification are required.

Verified By: Field Supervisor

Date: 14-04-2022





#### 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 Refrence No.	RPT-22-HVS-0	013	

Standard Equipment Information		
Verification Equipment Type	Tisch's TSP HVS	Tish 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	Date		Time		K-Factor	Counts/ Minute (R) Tota Cour		TSP Sample	Dust Concentration (ug/m3), (C)
Test No.	Dute	Start-time	End-time	Elapsed Time (in min)	K-Factor (K=C/R)	x-axis	(TC)	ID No.	y axis
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
19					0.00101				

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

By Linear Regression of y on x: slope, mh= 1.4403

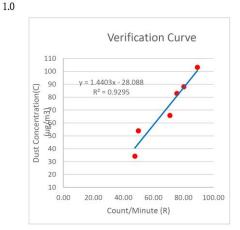
intercept,ch= -28.0877

\*Correlation Coefficient,R= 0.9641 Verification Test Result: <u>Strong Correlation, Results were accepted.</u>

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

Verified By: Kn Technical Manager

Date: 19-10-2022



V ir on mental         Calibration Certification Information         Calibration Street S/N: 438320       Ta: 296 %K         Operator: Jim Tisch       Pa: 755.1       mm Hg         Calibrator S/N: 34655         Num Hg         Calibration Model #: TE-5025A       Calibrator S/N: 3465         Num Hg         Calibrator S/N: 3465         Data Tabulation         Mathematical Colspan="2">Mathematical Colspan="2">Mathematical Colspan="2">Colspan="2"Colspan="2"Colspan="2"Colspan="2"Colspan="2"Colspan="2"Colspan="2"Colspan="2"Colspan="2"Colspan="2"Colspan="2"Colspan="2"Colspan="2"Colspan="2"Colspan="2"Colspan="2"Colspan="2"Colspan="2"Colspa			Ch		J			D	ALIBRATION UE DATE: e 28, 2023	
Cal. Date: June 28, 2022       Rootsmeter S/N: 438320       Ta: 296       *K         Operator: Jim Tisch       Pa: 755.1       mm Hg         Calibrator S/N: 3465         Calibration Model #: TE-5025A       Calibrator S/N: 3465         Main Model #: TE-5025A       Calibrator S/N: 3465         Data Tabulation         Tota Tabulation         Vstd       QAH(Ta/Pa)       (y-axis)       (y-axis)         Operator: Main Main Main Main Main Main Main Main	i v i r	61	2	-	of.	Cal	ibri	ntion		
Operator:       Jim Tisch       Pa: 755.1       mm Hg         Calibration Model #:       TE-5025A       Calibrator S/N:       3465         Image: Calibration Model #:       TE-5025A       Calibrator S/N:       3.2       2.00         1       1       2       1       1.4290       3.2       2.00         2       3       4       1       0.030       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       Qstd $\sqrt{\Delta H (Pstd) (Tstd)}$ Qa $\sqrt{\Delta H (Ta/Pa)}$ 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       1.0934       1.4000       0.9887       1.1509       2.3456       0.9830       1.3826       1.7708         QSTD       b=       -0.01207       r=       0.99998       r=       0.999998 <td< td=""><td></td><td></td><td></td><td>Calibration</td><td>Certificati</td><td>on Informat</td><td>ion</td><td></td><td></td></td<>				Calibration	Certificati	on Informat	ion			
Calibration Model #: TE-5025A       Calibrator S/N: 3465         Calibrator Model #: TE-5025A         Calibrator S/N: 3465         Run (m3) (m3) (min) (min) (mm Hg) (in H2O) (	Cal. Date:	June 28, 20	022	Roots	meter S/N:	438320	Ta:	296	°K	
$ \begin{array}{ c c c c c c c c c c c c c c c c c c c$	Operator:	Jim Tisch					Pa:	755.1	mm Hg	
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$\frac{1}{2} + \frac{1}{2} + \frac{1}$		Run	Contract Contract of Contract	1000	100 C-1200			Constant of the second s		
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$ \begin{array}{ c c c c c c c c c c c c c c c c c c c$		3	5	6	1	0.9050	7.9	5.00	1	
$\begin{array}{ c c c c c c } \hline Data Tabulation \\ \hline Data Tabulation \\ \hline \\ $				8	1	0.8590	8.8	5.50	1	
Vstd         Qstd $\sqrt{\Delta H(\frac{Pa}{Pstd})(\frac{Tstd}{Ta})}$ Qa $\sqrt{\Delta H(Ta/Pa)}$ (m3)         (x-axis)         (y-axis)         (y-axis)         (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         0.9835         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           m=         2.05924         m=         1.28946         b=         -0.01207           Vstd= $\Delta Vol((Pa-\Delta P)/Pstd)(Tstd/Ta)$ Va= $\Delta Vol((Pa-\Delta P)/Pa)$ Qa=         Va/ $\Delta Time$ Vstd= $\Delta Vol((Pa-\Delta P)/Pstd)(Tstd/Ta)$ Va= $\Delta Vol((Pa-\Delta P)/Pa)$ Qa= $V_{\Delta} H(\sqrt{\Delta H(Ta/Pa)}) - b$ Vstd=           Standard Conditions         Tstd:         298.15 °K         Pstd:         Tstd:         298.15 °K         Pstd:         Tstd:         298.15 °K         Pstot manometer reading (in H2O)         US EPA recommend		5	9	10	1	0.7110	12.8	8.00	]	
$ \begin{array}{ c c c c c c c c c c c c c c c c c c c$				C	Data Tabula	ata Tabulation				
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$ \begin{array}{ c c c c c c c c c c c c c c c c c c c$		(m3)	(x-axis)	(y-axi	is)	Va	and the second sec	(y-axis)		
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$ \begin{array}{ c c c c c c c c c c c c c c c c c c c$										
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$ \begin{array}{ c c c c c c c c c c c c c c c c c c c$										
$ \begin{array}{ c c c c c c } \hline \textbf{QSTD} & \underline{\textbf{b}= & -0.01929} & \textbf{QA} & \underline{\textbf{b}= & -0.01207} & \\ \hline \textbf{r}= & \textbf{0.99998} & \hline \textbf{r}= & \textbf{0.99998} & \hline \textbf{r}= & \textbf{0.99998} & \\ \hline \textbf{calculations} & \hline \textbf{r}= & \textbf{0.99998} & \hline \textbf{r}= & \textbf{0.99998} & \\ \hline \textbf{calculations} & \hline$		0.0001				0.3830		the second s		
r=0.99998r=0.99998CalculationsVstd= $\Delta Vol((Pa-\Delta P)/Pstd)(Tstd/Ta)$ Va= $\Delta Vol((Pa-\Delta P)/Pa)$ Qstd= $\Delta Vol((Pa-\Delta P)/Pstd)(Tstd/Ta)$ Va= $\Delta Vol((Pa-\Delta P)/Pa)$ Qstd= $\Delta Vol((Pa-\Delta P)/Pa)$ <td co<="" td=""><td></td><td>QSTD</td><td></td><td>and the second se</td><td></td><td>AO</td><td></td><td></td><td></td></td>	<td></td> <td>QSTD</td> <td></td> <td>and the second se</td> <td></td> <td>AO</td> <td></td> <td></td> <td></td>		QSTD		and the second se		AO			
Vstd= $\Delta Vol((Pa-\Delta P)/Pstd)(Tstd/Ta)$ Va= $\Delta Vol((Pa-\Delta P)/Pa)$ Qstd=Vstd/ $\Delta Time$ Qa=Va/ $\Delta Time$ For subsequent flow rate calculations:Qstd= $1/m((\sqrt{\Delta H(\frac{Pa}{Pstd})(\frac{Tstd}{Ta})})-b)$ Qa= $1/m((\sqrt{\Delta H(Ta/Pa}))-b)$ Standard ConditionsTstd:298.15 °KRECALIBRATIONPstd:760 mm HgUS 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 nage 30			r=	0.999	98		r=	0.99998		
Qstd=Vstd/ $\Delta$ TimeQa=Va/ $\Delta$ TimeFor subsequent flow rate calculations:Qstd= $1/m((\sqrt{\Delta H(\frac{Pa}{Pstd})(\frac{Tstd}{Ta})})-b)$ Qa= $1/m((\sqrt{\Delta H(Ta/Pa}))-b)$ Standard ConditionsTstd:298.15 °KPstd:Pstd:760 mm HgUS EPA recommends annual recalibration per 199840 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 nage 30					Calculation	ns				
For subsequent flow rate calculations: $Qstd= 1/m((\sqrt{\Delta H(\frac{Pa}{Pstd})(\frac{Tstd}{Ta})})-b)$ $Qa= 1/m((\sqrt{\Delta H(Ta/Pa}))-b)$ Standard ConditionsTstd:298.15 °KPstd:760 mm HgWH: calibrator manometer reading (in H2O)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 nage 30.				)/Pstd)(Tstd/Ta	a)			P)/Pa)		
Qstd= $1/m\left(\left(\sqrt{\Delta H\left(\frac{Pa}{Pstd}\right)\left(\frac{Tstd}{Ta}\right)}\right)-b\right)$ Qa= $1/m\left(\left(\sqrt{\Delta H\left(Ta/Pa\right)}\right)-b\right)$ Standard ConditionsTstd:298.15 °KPstd:760 mm HgUS 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 nage 30		Qstd=	Vstd/∆Time							
Standard Conditions         Tstd: 298.15 °K         Pstd:       760 mm Hg         US EPA recommends annual recalibration per 1998         40 Code of Federal Regulations Part 50 to 51,         AP: rootsmeter manometer reading (mm Hg)         Fa: actual absolute temperature (°K)       Determination of Suspended Particulate Matter in the Atmosphere 9.2.17 nage 30.			//		ent flow rat	te calculation	IS:			
Tstd:       298.15 °K       RECALIBRATION         Pstd:       760 mm Hg       US EPA recommends annual recalibration per 1998         AH: calibrator manometer reading (in H2O)       40 Code of Federal Regulations Part 50 to 51,         AP: rootsmeter manometer reading (mm Hg)       Appendix B to Part 50, Reference Method for the         Pa: actual barometric pressure (mm Hg)       Determination of Suspended Particulate Matter in		Qstd=	1/m((√∆H(	Pa <u>Tstd</u> Pstd Ta	))-b)	Qa=	1/m (( √∆H	(Та/Ра))-ь)		
Pstd:       760 mm Hg         Key       US EPA recommends annual recalibration per 1998         AH: calibrator manometer reading (in H2O)       40 Code of Federal Regulations Part 50 to 51,         AP: rootsmeter manometer reading (mm Hg)       Appendix B to Part 50, Reference Method for the         Pa: actual barometric pressure (mm Hg)       Determination of Suspended Particulate Matter in         the Atmosphere 9 2 17, page 30       the Atmosphere 9 2 17, page 30					-					
Key         US EPA recommends annual recalibration per 1998           AH: calibrator manometer reading (in H2O)         40 Code of Federal Regulations Part 50 to 51,           AP: rootsmeter manometer reading (mm Hg)         Appendix B to Part 50, Reference Method for the           Fa: actual absolute temperature (°K)         Determination of Suspended Particulate Matter in           Pa: actual barometric pressure (mm Hg)         the Atmosphere 9 2 17 page 30	D.1.1	22.00					RECAL	IBRATION		
AH: calibrator manometer reading (in H2O)       40 Code of Federal Regulations Part 50 to 51,         AP: rootsmeter manometer reading (mm Hg)       Appendix B to Part 50, Reference Method for the         Fa: actual absolute temperature (°K)       Determination of Suspended Particulate Matter in         Pa: actual barometric pressure (mm Hg)       the Atmosphere 9 2 17, nage 30	rsiu.	and the second se				US EPA reco	mmends ar	nual recalibratio	n per 1998	
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Pa: actual barometric pressure (mm Hg) the Atmosphere, 9,2,17, page 30										
Ine Almosphere, 9717 hage 30	Ia: actual ab									
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Tisch Environmental, Inc. 145 South Miami Avenue Village of Cleves, OH 45002

<u>www.tisch-env.com</u> 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

	The admin building				
Location:	inside the construction	Site ID:	A1a	Date:	06-Oct-2022
	site				
Serial No:	1048	Model:	TE-5170X	Operator:	Kelvin Lau

#### Ambient Condition

Corrected Pressure (mm Hg): 761.3 Temperature (deg K): 302.1

#### 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	In,H2O	Qa, X-Axis	I, CFM	IC, Y-Axis
Test #	(in)	(m3/min)	(chart)	(corrected)
1	1.25	0.871	27.8	27.61
2	1.87	1.063	33.5	33.30
3	2.15	1.139	35.9	35.68
4	2.47	1.221	38.2	37.95
5	3.05	1.355	42.0	41.79

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

m=	29.3199	b=	2.1415	Corr. Coeff=	0.9998
Sample	r set point(SSP)	38	CFM		
Qstd = 1/m[Sqrt(H IC = I[Sqrt(Pa/Pstd Qstd = standard fld IC = corrected chai I = actual chart res m = calibrator Qstd b = calibrator Qstd Ta = actual temper Pa = actual pressur Tstd = 298 deg K Pstd = 760 mm Hg	2O(Pa/Pstd)(Tstd/Ta))-b] )(Tstd/Ta)] ow rate t response ponse d slope	g K)	Calculations m = sampler slope b = sampler intercept I = chart response Tav = average temperature Pav = average pressure		
(1.21 <sup>m</sup> m+b)/[sqrt(.	298/Tav)(Pav/760)]		Date:	06-Oct	-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:	06-Oct-2022			
Serial No:	1085	Model:	TE-5170X	Operator:	Kelvin Lau			
Ambient Condition								

Corrected Pressure (mm Hg): 761.3 Temperature (deg K): 302.1

# 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	In,H2O	Qa, X-Axis	I, CFM	IC, Y-Axis						
Test #	(in)	(m3/min)	(chart)	(corrected)						
1	1.34	0.901	32.8	32.57						
2	1.78	1.038	35.4	35.18						
3	2.37	1.196	38.5	38.24						
4	2.65	1.264	39.6	39.41						
5	3.86	1.523	44.3	43.99						

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

m=	18.3756	b=	16.1154	Corr. Coeff=	0.9996
Sampl	er set point(SSP)	39	CFM		
			Calculations		
Qstd = 1/m[Sqrt()	H2O(Pa/Pstd)(Tstd/Ta))-b]		m = sampler slope		
IC = I[Sgrt(Pa/Pst	d)(Tstd/Ta)]		b = sampler intercept		
			I = chart response		
Qstd = standard f	low rate		Tav = average temperature		
IC = corrected cha	art response		Pav = average pressure		
I = actual chart re	sponse				
m = calibrator Qs	std slope				
b = calibrator Qst	td intercept				
Ta = actual tempe	erature during calibration (deg	K)			
Pa = actual pressu	ure during calibration (mm Hg)	1			
Tstd = 298 deg K					
Pstd = 760 mm H	3				
For subsequent c	alculation of sampler flow:				
(1.21*m+b)/[Sqrt	(298/Tav)(Pav/760)]				
Checked by:	far		Date:	06-Oct	-2022

# APPENDIX D Monitoring Data (Air)

### Location:

#### A1a

October 2022

Parameter :

Major Dust Source

**Monitoring Period:** 

TSP 1-hour

Construction activities and daily operation of the sewerage treatment plant

Other Factors

NA

Date	Weather	Start Time	1 <sup>st</sup> Hour	2 <sup>nd</sup> Hour	3 <sup>rd</sup> Hour
Date	Date weather Start Thire		(µg/m³)	(µg/m³)	(µg/m³)
06/10/2022	Cloudy	14:45	68	62	75
11/10/2022	Sunny	14:17	70	67	69
21/10/2022	Sunny	14:53	75	78	67
27/10/2022	Sunny	14:10	57	69	73
		Average		69	
		Range		57 - 78	

15 <sup>th</sup> EM&A Report - October 2022	
Location:	A2a
Monitoring Period:	October 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	2 <sup>nd</sup> Hour	3 <sup>rd</sup> Hour
			(µg/m³)	(µg/m³)	(µg/m³)
06/10/2022	Sunny	14:31	61	66	68
11/10/2022	Sunny	14:01	64	57	60
21/10/2022	Sunny	14:23	63	62	59
27/10/2022	Sunny	13:59	56	64	67
		Average		62	
		Range		56 - 68	

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

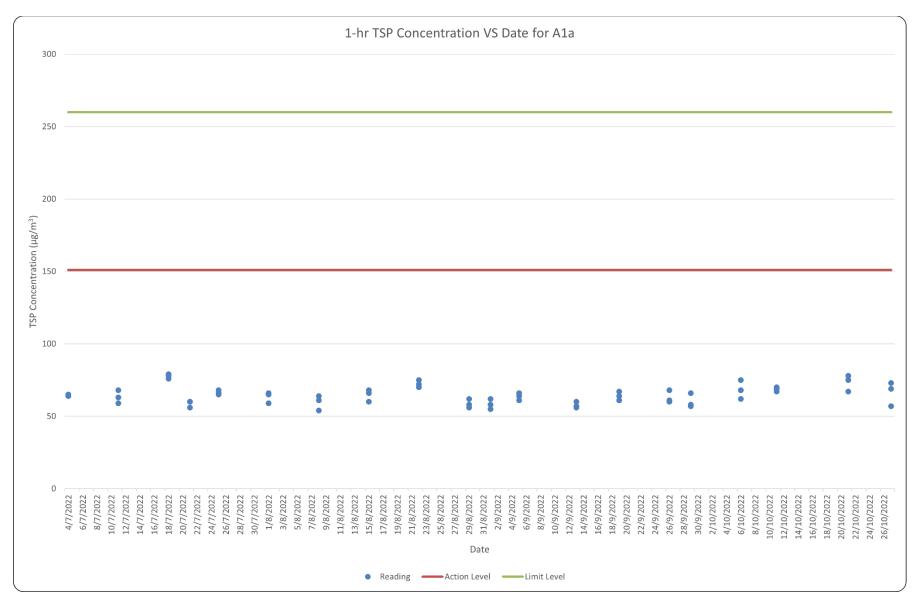
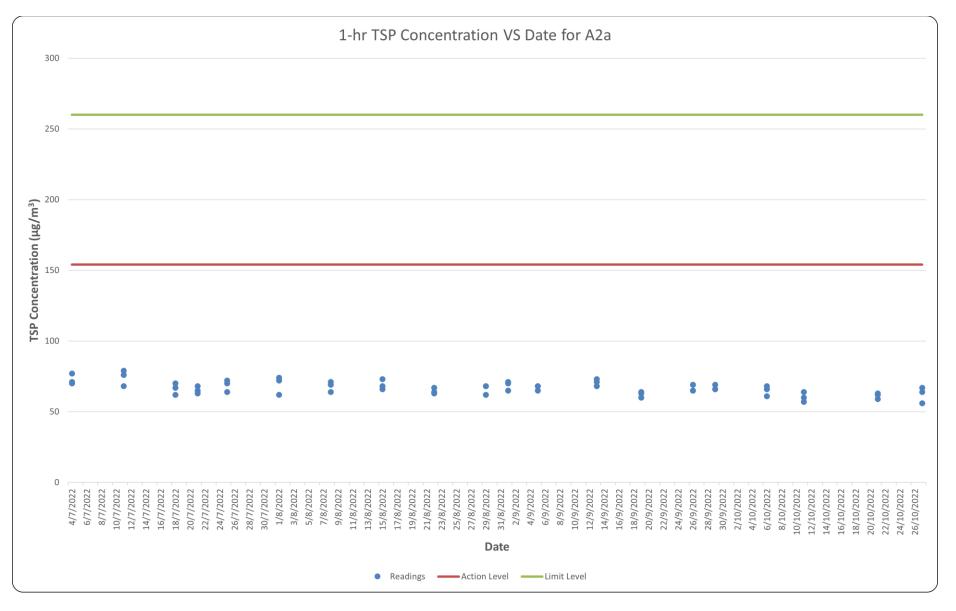


Figure D.2 Measured 1-Hour TSP at the existing outfall pumping station inside the construction site (A2a)



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

Avg Air Temp	Avg Atmospher ic Pressure	Weather Condition	Elapse Ti	me	Sampli ng Time	Flow Rate	Standard Air Volume	Filter Weight (g)		Filter Weight (g)		Particulate weight	Conc.
(°C)	(mm Hg)		Initial (min)	Final (min)	Actual (min)	(m³/min )	(m <sup>3</sup> )	Initial	Final	(g)	(µg/m³)		
28.6	1015.0	Cloudy	229230	230707	1477	1.15	1698	2.7564	2.8160	0.0596	35		
24.7	1016.1	Sunny	230707	232253	1546	1.16	1792	2.7523	2.8967	0.1444	81		
25.9	1016.4	Sunny	232253	233728	1475	1.26	1857	2.7620	2.8850	0.1230	66		
25.1	1015.7	Sunny	233728	235194	1466	1.36	1998	2.7596	2.9330	0.1734	87		
	(°C) 28.6 24.7 25.9	Atmospher ic Pressure       (°C)     (mm Hg)       28.6     1015.0       24.7     1016.1       25.9     1016.4	Atmospher ic PressureCondition(°C)(mm Hg)28.61015.028.61016.124.71016.125.91016.4	Atmospher ic Pressure         Condition           (°C)         (mm Hg)         Initial (min)           28.6         1015.0         Cloudy         229230           24.7         1016.1         Sunny         230707           25.9         1016.4         Sunny         232253	Atmospher ic Pressure         Condition           (°C)         (mm Hg)         Initial (min)         Final (min)           28.6         1015.0         Cloudy         229230         230707           24.7         1016.1         Sunny         230707         232253           25.9         1016.4         Sunny         232253         233728	Atmospher ic Pressure         Condition         Initial (min)         Final (min)         Actual (min)           (°C)         (mm Hg)         Initial (min)         Final (min)         Actual (min)           28.6         1015.0         Cloudy         229230         230707         1477           24.7         1016.1         Sunny         230707         232253         1546           25.9         1016.4         Sunny         232253         233728         1475	Atmospher ic Pressure         Condition         ng Time         Rate           (°C)         (mm Hg)         Initial (min)         Final (min)         Actual (min)         (m³/min)           28.6         1015.0         Cloudy         229230         230707         1477         1.15           24.7         1016.1         Sunny         230707         232253         1546         1.16           25.9         1016.4         Sunny         232253         233728         1475         1.26	Atmospher ic Pressure         Condition         Initial (min)         Final (min)         ng Time         Rate         Air Volume           (°C)         (mm Hg)         Initial (min)         Final (min)         Actual (min)         (m³/min)         (m³)           28.6         1015.0         Cloudy         229230         230707         1477         1.15         1698           24.7         1016.1         Sunny         230707         232253         1546         1.16         1792           25.9         1016.4         Sunny         232253         233728         1475         1.26         1857	Atmospher ic Pressure         Condition         Initial (min)         Final (min)         ng Time         Rate         Air Volume           (°C)         (mm Hg)         Initial (min)         Final (min)         Actual (min)         (m³/min )         (m³)         Initial           28.6         1015.0         Cloudy         229230         230707         1477         1.15         1698         2.7564           24.7         1016.1         Sunny         230707         232253         1546         1.16         1792         2.7523           25.9         1016.4         Sunny         232253         233728         1475         1.26         1857         2.7620	Atmospher ic Pressure       Condition       I       ng I       ng Time       Rate       Air Volume       Air Volume       I       I       I         (°C)       (mm Hg)       Initial (min)       Final (min)       Actual (min)       (m³/min)       (m³)       Initial       Final         28.6       1015.0       Cloudy       229230       230707       1477       1.15       1698       2.7564       2.8160         24.7       1016.1       Sunny       230707       232253       1546       1.16       1792       2.7523       2.8967         25.9       1016.4       Sunny       232253       233728       1475       1.26       1857       2.7620       2.8850	Atmospher ic PressureConditionInitial (min)Final (min)Rate TimeAir VolumeAir Volumeweight(°C)(mm Hg)Initial (min)Final (min) $(m^3)$ $(m^3)$ Initial (m^3)Final (m^3)(g)28.61015.0Cloudy22923023070714771.1516982.75642.81600.059624.71016.1Sunny23070723225315461.1617922.75232.89670.144425.91016.4Sunny23225323372814751.2618572.76202.88500.1230		

Average	67
Range	35 - 87

Location:	A2a
Parameter :	TSP 24-hour
Major Site Activities	Construction activities and dai
Major dust source	Routine operation of the Sewa
Other Factors	NA

TSP 24-hour Construction activities and daily operation of the sewerage treatment plant Routine operation of the Sewage Treatment Plant

Start Date	Avg Air Temp	Avg Atmospheric Pressure	Weather Condition	Elapse Tim	le	Sampling Time	Flow Rate	Standard Air Volume	Filter We	ight (g)	Particu late weight	Conc.
	(°C)	(mm Hg)		Initial (min)	Final (min)	Actual (min)	(m <sup>3</sup> /min)	(m <sup>3</sup> )	Initial	Final	(g)	(μg/ m³)
08/10/2022	27.4	1015.9	Sunny	442180	443666	1486	1.24	1846	2.7718	2.8666	0.0948	51
11/10/2022	24.7	1016.1	Sunny	443666	445215	1549	1.31	2025	2.7599	2.8979	0.1380	68
21/10/2022	25.9	1016.4	Sunny	445215	446713	1498	1.30	1952	2.7600	2.9104	0.1504	77
27/10/2022	25.1	1015.7	Sunny	446713	448178	1465	1.30	1911	2.7573	2.8557	0.0984	51

Average62Range51 -

77

\*Remark: For A2a, the monitoring day of 06/10/2022 was changed to 08/10/2022 due to mechanical failure of the High Volume samplers.

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

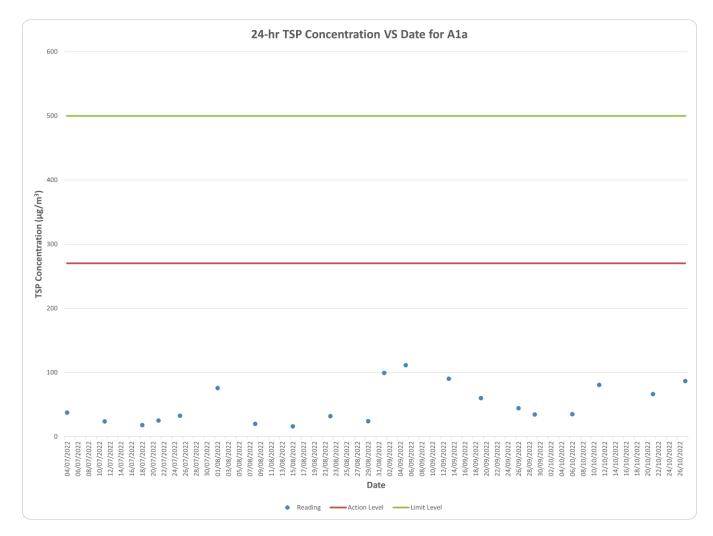
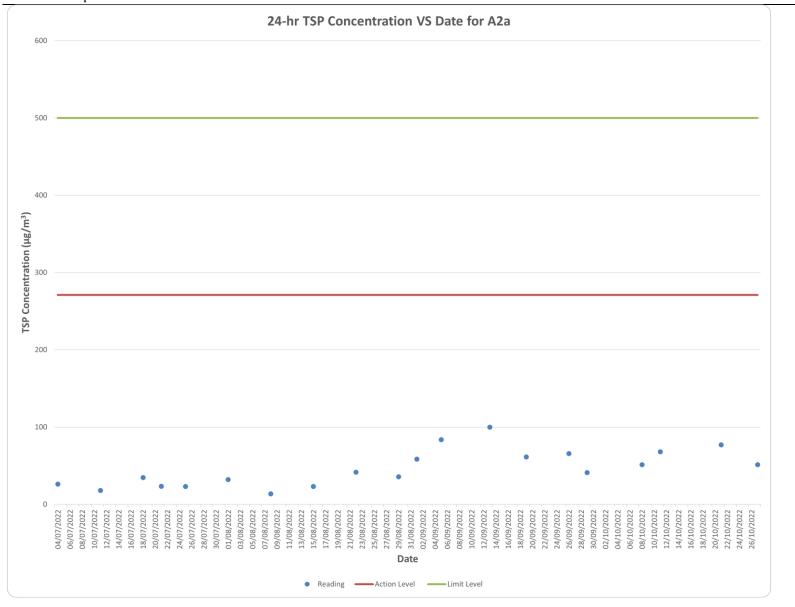


Figure D.4 Measured 24-Hour TSP at the existing outfall pumping station inside the construction site (A2a)



# APPENDIX E Calibration Certificates (Noise)



# **Certificate of Calibration**

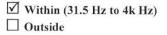
for

Description:	Sound Level Meter
Manufacturer:	SVANTEK
Type No.:	971 (Serial No.: 96062)
Microphone:	ACO 7052 E (Serial No.: 79778)
Preamplifier:	SVANTEK SV 18 (Serial No.:97276)

#### Submitted by:

Customer: Acuity Sustainability Consulting Limited Address: Unit E, 12/F., Ford Glory Plaza, Nos. 37-39 Wing Hong Street, Cheung Sha Wan, Kowloon, Hong Kong

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



#### 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 June 2022

Date of calibration: 27 June 2022

Calibrated by:	0	Cheuk Hang lity Manager
Date of issue: 27 June 2022	AIR TESTING TAC	ing institution
Certificate No.: APJ22-029-CC002	((A+A) *L)	Page 1 of 4
Room 422,Leader Industrial Centre,57-59 Au Pui War	Street ,Fo Tan, Shatin,N.T.,Hong Kong	
Tel: (852) 266 Homepage: http://www.aa-l		



#### **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.

#### 1. Calibration Conditions:

Air Temperature:	24.2 °C
Air Pressure:	1004 hPa
<b>Relative Humidity:</b>	60.8 %

#### 2. Calibration Equipment:

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

#### 3. Calibration Results

Sound Pressure Level

Reference Sound Pressure Level

Sett	ing of U	nit-under-t	est (UUT)	App	Applied value		IEC 61672 Class 1
Range, dB	Freq.	Weighting	Time Weighting	Level, dB	Frequency, Hz	dB	Specification, dB
25-124.5	dBA	SPL	Fast	94	1000	94.0	±0.4

Linearity

Setting of Unit-under-test (UUT)			Applied value U		UUT Reading,	IEC 61672 Class	
Range, dB	Freq.	Weighting	Time Weighting	Level, dB	Frequency, Hz	dB	Specification, dB
				94		94.0	Ref
25-124.5	dBA	SPL	Fast	104	1000	104.0	±0.3
				114		114.0	±0.3

#### Time Weighting

Sett	ing of Unit-under-test (UUT)			test (UUT) Applied value		Applied value U		UUT Reading,	IEC 61672 Class 1
Range, dB	Freq. W	eighting	Time Weighting	Level, dB	Frequency, Hz	dB	Specification, dB		
25-124.5	JD A	CDI	Fast	0.4	1000	94.0	Ref		
23-124.5	dBA SPL		Slow	94	1000	94.0	±0.3		

Certificate No.: APJ22-029-CC002

\* Page 2 of 4

A.F.A)

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Frequency Response

Linear Response

Setting of Unit-under-test (UUT)			App	lied value	UUT Reading,	IEC 61672 Class 1 Specification, dB	
Range, dB	Freq. Weighting Time Weighting Level, dB Frequency,		Frequency, Hz	dB			
					31.5	94.3	±2.0
					63	94.2	±1.5
					125	94.1	±1.5
25-124.5	dB	SPL	Fast	94	250	94.1	±1.4
23-124.3	uВ	SPL	rast	94	500	94.0	±1.4
					1000	94.0	Ref
					2000	93.7	±1.6
					4000	93.1	+1.6

A-weighting

Setting of Unit-under-test (UUT)		App	lied value	UUT Reading,	IEC 61672 Class 1		
Range, dB	Freq. W	eighting	Time Weighting	Level, dB	Frequency, Hz	dB	Specification, dB
					31.5	54.9	-39.4 ±2.0
					63	68.0	-26.2 ±1.5
			125	78.0	-16.1±1.5		
25-124.5	dBA	SPL	Fast	04	250	85.4	-8.6±1.4
23-124.5	UDA	SPL	rast	94	500	90.8	$-3.2 \pm 1.4$
					1000	94.0	Ref
				2000	94.9	$+1.2 \pm 1.6$	
					4000	94.2	$+1.0 \pm 1.6$

C-weighting

Sett	Setting of Unit-under-test (UUT)		est (UUT)	App	Applied value		IEC 61672 Class 1	
Range, dB	Freq. W	eighting	Time Weighting	Level, dB	Frequency, Hz	dB	Specification, dB	
					31.5	91.3	-3.0 ±2.0	
					63	93.4	-0.8±1.5	
			125	93.9	-0.2 ±1.5			
25-124.5	dBC	SPL	East	94	250	94.1	$-0.0 \pm 1.4$	
25-124.5	UDC	SFL	Fast	94	500	94.1	$-0.0 \pm 1.4$	
					1000	94.0	Ref	
					2000	93.6	-0.2 ±1.6	
					4000	92.4	-0.8±1.6	

Certificate No.: APJ22-029-CC002



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#### 4. 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	± 0.15
	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	± 0.10
104 dB	1000 Hz	± 0.05
114 dB	1000 Hz	± 0.05

The uncertainties are evaluated for a 95% confidence level.

#### Note:

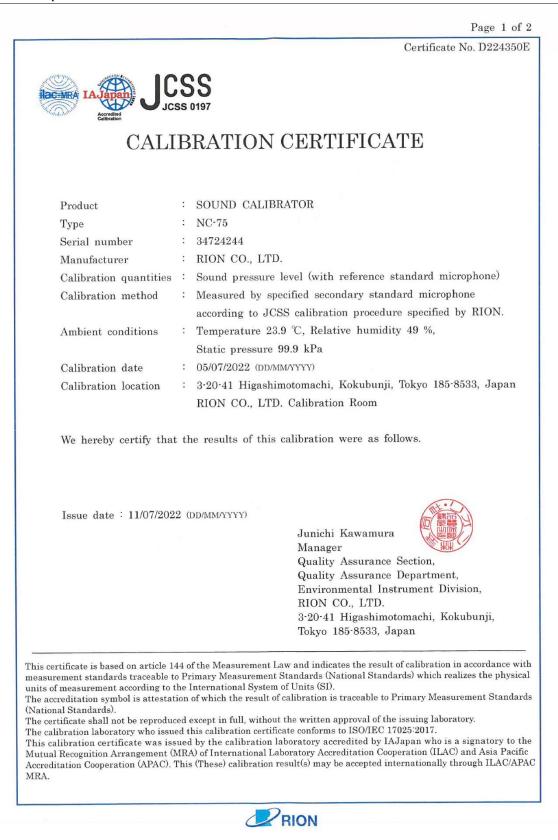
The values given in this certification only related to the values measured at the time of the calibration and any uncertainties quoted will not allow for the equipment long-term drift, variations with environmental changes, vibration and shock during transportation, overloading, mis-handling, or the 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.

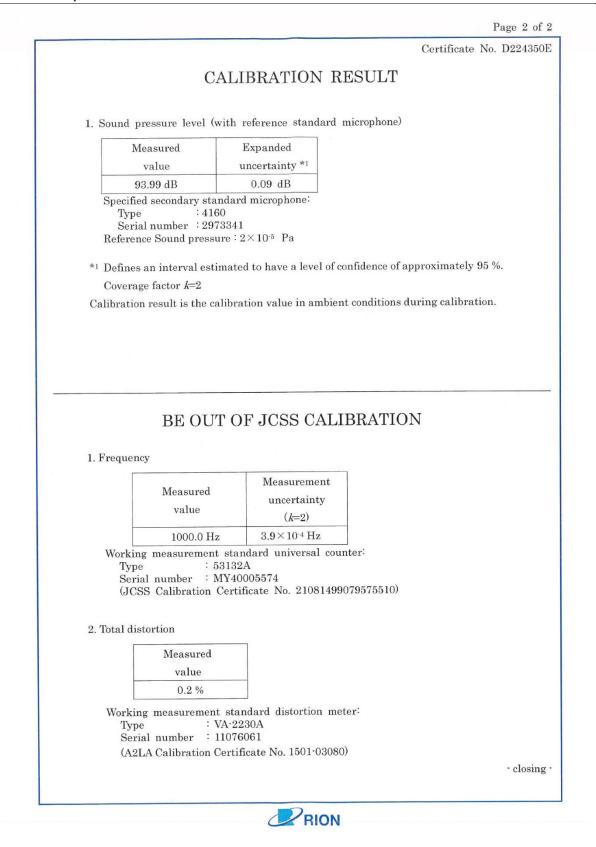
Certificate No.: APJ22-029-CC002



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## APPENDIX F Monitoring Data (Noise)

Location:	N2a
Monitoring Period:	October 2022
Parameter :	Noise
Major Noise Source:	Construction activities and daily operation of the sewerage treatment plant
Other Factors	NA

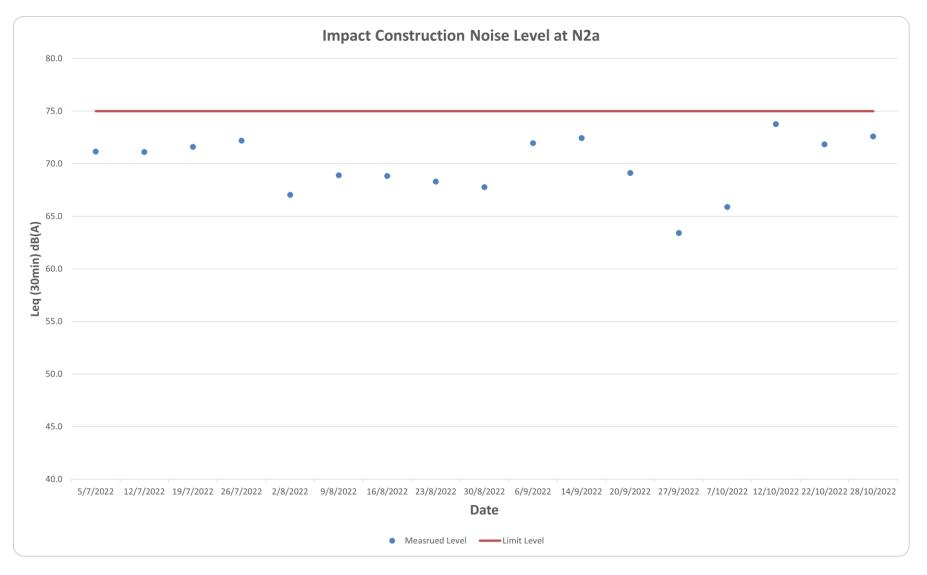
Date	Weather	Start Time	L <sub>eq</sub>	L <sub>10</sub>	L <sub>90</sub>
07/10/2022	Sunny	15:26	65.9	68.2	63.7
12/10/2022	Sunny	16:06	73.8	74.6	72.6
22/10/2022	Sunny	15:32	71.8	73.6	69.3
28/10/2022	Sunny	14:34	72.6	74.3	69.6
		Average		71.8	
		Range	6	5.9 – 73	.8

Location:	N3a
Monitoring Period:	October 2022
Parameter :	Noise
Major Noise Source:	Construction activities and daily operation of the sewerage treatment plant
Other Factors	NA

Date	Weather	Start Time	Leq	L <sub>10</sub>	L90
07/10/2022	Sunny	14:15	67.2	69.7	59.1
12/10/2022	Sunny	14:56	68.7	70.2	60.7
22/10/2022	Sunny	14:35	64.1	66.3	54.3
28/10/2022	Sunny	13:38	71.8	74.6	55.2
		Average		68.8	
		Range	6	4.1 – 71.	8

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)



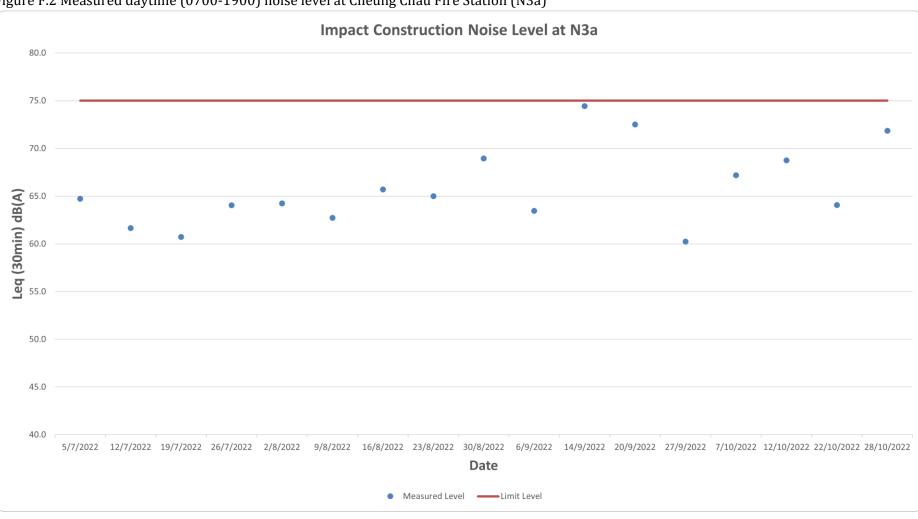


Figure F.2 Measured daytime (0700-1900) noise level at Cheung Chau Fire Station (N3a)

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

# 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?	Location / Timing of implementation of Measures			What requirements or standards for the measures to achieve?
			measures ?	D	с	0	_
Construction Phase	(Upgrading Works of Cheung Chau STW and Pak She SPS	(DP Component))				•	
S.3.5.5	<ul> <li>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> <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> </li> </ul>	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 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		V		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	Location / Timing of implementation of Measures			What requirements or standards for the measures to achieve?
			measures?	D	С	0	
S.3.10.1	Any excavated or stockpile of dusty material should be covered entirely by impervious sheeting or spayed 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		V		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		V		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		V		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	С	0	
S.3.10.1	Good site practices for concrete batching plant 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. 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. 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> )	Air Quality (fugitive dust) Control during Construction Phase	Contractors		V		Annex 4 and Annex 12 of EIAO -TM, Air Pollution Control (Construction Dust) Regulation Best Practical Means for Cement Works (Concrete Batching Plant) BPM 3/2(93)

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?
Construction Phase (U	Ipgrading Works of Cheung Chau STW and Pak She SPS	(DP Component))	•	•	
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): Generator Poker, vibratory, hand-held Breaker, excavator mounted (hydraulic) Excavator Tracked Mobile Crane Vibratory Compactor Dumper Air compressor Concrete Pump Pilling Rig	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

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
				D	С	0	measures to achieve?
Construction Phase (U	pgrading Works of Cheung Chau STW and Pak She SPS (DP Com	ponent) and Sewers Work	s (non-DP Compo	nent))			1
S.5.7.1	<ul> <li>Practices outlined in ProPECC PN 1/94 Construction Site Drainage are recommended, as highlighted below:</li> <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</li> </ul>	Water Quality Control	Contractors		~		<ul> <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	When to implement the measures?			What requirements or standards for the
			measures?	D	С	0	measures to achieve?
(cont)	<ul> <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		V		<ul> <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	<ul> <li>Mitigations Measures for General Construction Activities:</li> <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		1		<ul> <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
			ineasures :	D	с	0	measures to achieve?
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		V		<ul> <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	<ul> <li>Mitigations Measures for Spillage of Chemicals:</li> <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		V		<ul> <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	When to implement the measures?			What requirements or standards for the
			measures?	D	С	0	measures to achieve?
Construction Phase	(Upgrading Works of Cheung Chau STW and Pak She SPS (DP Comp	oonent) and Sewers Work	s (non-DP Compon	ient))			1
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		1		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		$\checkmark$		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		1		Waste Disposal Ordinance
S.6.6.1	Sufficient waste disposal points and regular collection of waste shall be provided.	Waste management during construction	Contractors		$\checkmark$		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		V		Waste Disposal Ordinance
S.6.6.1	Regular cleaning and maintenance programme for drainage systems, pumps and oil interceptors.	Waste management during construction	Contractors		$\checkmark$		Waste Disposal Ordinance

EIA Ref.	Recommended Environmental Protection Measures/ Mitigation Measures	Objectives of the recommended measures & main	Who to implement the measures?	When to implement the measures?			What requirements or standards for the
		concerns to address	ineasures :	D	с	0	measures to achieve?
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		V		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		V		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		V		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		$\checkmark$		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		V		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		V		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		$\checkmark$		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?		to impl measu		What requirements or standards for the
				D	с	0	measures to achieve?
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.	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		V		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		V		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?		to impl measu C	ement res? O	What requirements or standards for the measures to achieve?
Construction Phase	e (Upgrading Works of Cheung Chau STW (DP Component))			•			
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		$\checkmark$		N/A

EIA Ref.	Recommended Environmental Protection Measures/ Mitigation Measures	Objectives of the recommended measures & main concerns to address	Who to implement the measures?	to impl measur C	What requirements or standards for the measures to achieve?
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	V	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? D C O			What requirements or standards for the measures to achieve?
Table 11.8	Protection to Existing Trees within Works Areas 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. 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. 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	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	Who to implement the	When to implement the measures?			What requirements or standards for the	
		address	measures?	D	С	0	measures to achieve?	
Table 11.8	Tree Transplanting 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. 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	Landscape mitigation measures	DSD and Contractors	$\checkmark$	~		EIA, Annex 10 and Annex 18 of EIAO- TM	
Table 11.8	persons. Construction Light 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.	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?	to impl measu C	What requirements or standards for the measures to achieve?
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 soul 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	$\checkmark$	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	$\checkmark$	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

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

### Statistical Summary of Environmental Summons

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

### Statistical Summary of Environmental Prosecution

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

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

	h	mpact Monitoring Schedule for Upgr		ction, Treatment and Disposal Faciliti	es	
			Oct-22			
Sun	Mon	Tue	Wed	Thu	Fri	Sat
						1
	24-hour TSP monitoring for A1a & A2a 1-hour TSP monitoring for A1a & A2a	Daytime Noise monitoring for N2a & N3a				
2	3	4	5	6	7	8
				24-hour TSP monitoring for A1a 1-hour TSP monitoring for A1a & A2a	Daytime Noise monitoring for N2a & N3a	24-hour TSP monitoring for A2a
9	10	11	12	13	14	15
		24-hour TSP monitoring for A1a & A2a 1-hour TSP monitoring for A1a & A2a	Daytime Noise monitoring for N2a & N3a			
16	17	18	19	20	21	22
					24-hour TSP monitoring for A1a & A2a 1-hour TSP monitoring for A1a & A2a	Daytime Noise monitoring for N2a & N3a
23	24	25	26	27	28	29
				24-hour TSP monitoring for A1a & A2a 1-hour TSP monitoring for A1a & A2a	Daytime Noise monitoring for N2a & N3a	
30	31					
Remarks:				24-hour TSP monitoring for A1a & A2a 1-hour TSP monitoring for A1a & A2a		Daytime Noise monitoring for N2a & N3a
1. Daytime Noise Monitoring (07:00- 2 For A2a, the monitoring day of 06/		due to mechanical failure of the Hig	h Volume samplers			



