Contractor's General Submission Form (CGS)

Contract No.	3/WSD/15					
Project Title:	In-situ Reprovisioning of Sha Tin Water Treatment Works (South Works) – Advance Works					
CGS No.:	3WSD15/CGS/SEQ/ALL/JV	0280A	Issue:	Α	Date:	10/04/2017
To:	Engineer's Representative		Your Ref:			
Attention:	Mr. Derek K H Ng			4.70-101	Luni.	
From:	Ming Hing – Ming Hing Civ	il – Vasteam Joi	nt Venture			
Title:	Title					
Specification:	N/A or PS 1.9.2				(if a	oplicable)
Purpose:	☐ For Information	☐ For Comme	nt 🗆 For	r Appro	val	✓ For Record
Description of Con	tents:					
We herewith submit the EM&A Impact Monitoring Report (March 2017) for your perusal and record.						
Attachment:	✓ Yes □ No	Number of Copies:	5+5 CD	7		
Expected reply dat	e: 24 April 2017					
Issued By:	(ET/LP/cy)	P	rinted Name:		Mr.	Eros To
Designation:	Site Agent		Date:		10 A	pril 2017
Received By:	(Signature & Receive		ceived Date:			
* Delete if not applica	ble	7.00				
CC. JV Partner Office Master Co	_ ppy _	(w/ encl.) (w/ encl.)				



浩科環境工業有限公司

Acumen Environmental Engineering & Technologies Co., Ltd.

香港青衣(北)担杆山路11號地段

Your ref:

Our ref: CJO-3113

By hand

Chief Engineer /Project Management Water Supplies Department 46/F., Immigration Tower 7 Gloucester Road, Wanchai (Attn: Mr. Aletta CHIU)

10 April, 2017

Dear Sir,

In-Situ Reprovisioning of Sha Tin Water Treatment Works – South Works Environmental Permit EP-494/2015
Submission of 13th monthly EM&A Report

In accordance with the Condition 3.4 of the Environmental Permit (No. EP-494/2015), we submit herewith 5 hard copies and 2 electronic copies of the 13th monthly Environmental Monitoring and Audit (EM&A) Report (Rev.0) for your processing. I certified and confirmed the submission of this monthly EM&A Report had complied with the requirements as set out in the approved Environmental Monitoring and Audit (EM&A) Manual of the EIA Report (Register No.: AEIAR-187/2015).

Yours faithfully,

Ir Dr Lam, Gabriel, C.K.

Environmental Team Leader

c.c. Independent Environmental Checker



AECOM 8/F Grand Central Plaza, Tower 2 138 Shatin Rural Committee Road Shatin, Hong Kong 香港新界沙田鄉事會路138號 新城市中央廣場第2座8樓

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Your Ref:

Our Ref:

60479142/C/fyw1704101

By Hand & By Email

Chief Engineer/Project Management Water Supplies Department 46/F., Immigration Tower 7 Gloucester Road, Wanchai

Attn: Mr. Aletta CHIU

10 April 2017

Dear Sir,

Contract No.3/WSD/15

In-situ reprovisioning of Sha Tin Water Treatment Works (South Works) Advance Works Submission of 13th Monthly EM&A Report for March 2017

Reference is made to Environmental Team (ET)'s 13th Monthly EM&A Report for March 2017 (Rev. 0) submitted on 7 April 2017.

In accordance with the Condition 3.4 of the Environmental Permit (No.EP-494/2015), I verified and confirmed the submission of this Monthly EM&A Monitoring Report as compiled with the requirements as set in the approved Environmental Monitoring and Audit (EM&A) Manual of the EIA Report (Register No.: AEIAR-187/2015).

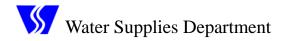
Should you have any queries, please feel free to contact the undersigned at 3922 9366.

Yours faithfully, AECOM Asia Co. Ltd.

Y W Fung

Independent Environmental Checker

c.c. Environmental Team Leader





MONTHLY ENVIRONMENTAL MONITORING AND AUDIT (EM&A) REPORT (NO. 13)

FOR

CONTRACT NO. 3/WSD/15 IN-SITU REPROVISIONING OF SHA TIN WATER TREATMENT WORKS – SOUTH WORKS

(Rev. 0)

MONTHLY ENVIRONMENTAL MONITORING AND AUDIT (EM&A) REPORT (NO. 13) -

FOR

CONTRACT NO. 3/WSD/15
IN-SITU REPROVISIONING OF SHA TIN WATER
TREATMENT WORKS – SOUTH WORKS

	Name	Signature
Prepared by	Mr. Lok, Kenny, K. M.	Z
Checked & Reviewed by	Ir Leung, Jacky, C. H.	
Approved & Certified by	Ir Dr. Lam, Gabriel, C. K. Environmental Team Leader (ETL)	Com
Verified & Confirmed by	Mr. Fung, Y. W. Independent Environmental Checker (IEC)	y

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EXECUTIVE SUMMARY

- A.1 Pursuant to the Environmental Impact Assessment (EIA) Ordinance, the Director of Environmental Protection (DEP) granted the Environmental Permit (No. EP- 494/2015) to the Water Supplies Department (WSD) to construct and operate the designated project for "In-situ Reprovisioning of Sha Tin Water Treatment Works South Works" ("The Project").
- A.2 Under Contract No. 3/WSD/15, Ming Hing Ming Hing Civil Vasteam Joint Venture (MMVJV) is commissioned by WSD to undertake the construction of the advance works while AECOM Asia Company Limited was appointed by WSD as the Engineer. For implementation of the environmental monitoring and audit (EM&A) programme under the Contract, Acumen Environmental Engineering & Technologies Company Limited was appointed by MMVJV as the Environmental Team (ET). AECOM Asia Company Limited was also employed by the WSD as the Independent Environmental Checker (IEC).
- A.3 The construction phase of the Contract commenced on 30 October 2015 for completion by 2018. The impact monitoring of the EM&A programme, including air quality, noise, water quality monitoring as well as environmental site inspections, commenced on 17 February 2016.
- A.4 This is the 13th monthly Environmental Monitoring and Audit Report for this Contract covering the period from 1 March 2017 to 31 March 2017 (the Reporting Period). As informed by the Contractor, major activities in the reporting period included:
 - Site clearance and site formation works at Logistics Centre area.
 - Construction of bored pile for Wall C and D.
 - Construction of Valve Chamber at Wall D
 - Modification of clarifier no.1
 - Site formation works for North Works Temporary Power House
 - Laying of storm water drain and construct box culvert at Tin Sum Nullah
- A.5 Environmental monitoring activities under the EM&A program in this reporting period are summarized below

Issues	Environmental Monitoring Parameters / Inspection	Occasions
Air	1-Hour TSP	7
Noise	L _{eq(30mins)} Daytime	7
Water Quality	Water Sampling	14
Inspection /	ET Regular Environmental Site Inspection	5
Audit	IEC Monthly Environmental Site Audit	1

- A.6 No exceedance of air quality, noise and water quality monitoring were recorded in this reporting period.
- A.7 No environmental complaint were received via EPD in this reporting period.
- A.8 No notification of any summons and successful prosecutions was received in this reporting period.
- A.9 No reporting change was made in this reporting period.
- A.10 There was no EPD site inspection were conducted in the reporting period.
- A.11 As informed by the Contractor, the major works for this Project in April 2017 will be:
 - Construction of valve chamber at Wall D
 - Site clearance and site formation works at Logistics Centre area.
 - Construction of bored pile for Wall C and Wall D.
 - Modification of clarifier no.1

;

- Site formation works for North Works Temporary Power House
- Laying of storm water drain and construct box culvert at Tin Sum Nullah
- A.12 EM&A monitoring for the 13th reporting period has been completed. The 14th monthly EM&A report will cover the period from 1 April 2017 to 30 April 2017.

I. INTRODUCTION

1.1. PROJECT BACKGROUND

- 1.1.1 Pursuant to the Environmental Impact Assessment (EIA) Ordinance, the Director of Environmental Protection (DEP) granted the Environmental Permit (No. EP- 494/2015) on 28 January 2015, subsequent to approval of the EIA Report (Register No. AEIAR-187/2015), to the Water Supplies Department (WSD) to construct and operate the designated project for "In-situ Reprovisioning of Sha Tin Water Treatment Works South Works" ("The Project").
- 1.1.2 Under Contract No. 3/WSD/15, Ming Hing Ming Hing Civil Vasteam Joint Venture (MMVJV) is commissioned by WSD to undertake the construction of the advance works while AECOM Asia Company Limited was appointed by WSD as the Engineer. For implementation of the environmental monitoring and audit (EM&A) programme under the Contract, Acumen Environmental Engineering & Technologies Company Limited was appointed by MMVJV as the Environmental Team (ET). AECOM Asia Company Limited was also employed by the WSD as the Independent Environmental Checker (IEC).
- 1.1.3 The construction phase of the Contract commenced on 30 October 2015 for completion by 2018. The general layout plan of the Contract components is presented in **Appendix A**.
- 1.1.4 ET conducted below baseline monitoring at designated locations according to the EM&A Manual.
 - Air quality and noise: from 21 December 2015 to 3 January 2016.
 - Water quality: from 15 December 2015 to 8 January 2016.
- 1.1.5 Baseline Monitoring Report was issued by the ET and verified by the IEC on 27 January 2016 and submitted to the EPD on 2 February 2016.
- 1.1.6 The impact monitoring of the EM&A programme, including air quality, noise, water quality monitoring as well as environmental site inspections, commenced on 17 February 2016.

1.2. ORGANIZATION STRUCTURE

1.2.1 The organization structure of the Contract is shown in **Appendix B**. Contact details of key personnel are summarized in below table:

Table 1-1: Key Personnel Contact for Environmental Works

Party	Position	Name	Telephone
Water Supplies	Engineer / Project	Mr. Chiu, Aletta C. M.	2829 5653
Department	Management		
AECOM	Senior Resident Engineer	Mr. Ng, Derek, K. H.	9717 1420
	(Civil)		
	Independent Environmental	Mr. Fung, Y. W.	3922 9366
	Checker	-	
	Deputy Independent	Ms. Lam, Lemon, M. C.	3922 9381
	Environmental Checker		
Ming Hing - Ming	Project Manager	Mr. Lam, Larry, M. W.	6478-0501
Hing Civil - Vasteam	Site Agent	Mr. To, Eros, W. H.	9223 9590
Joint Venture			
Acumen Env. Eng. &	Environmental Team	Ir Dr. Lam, Gabriel, C.	2333 6823
Tech. Co. Ltd.	Leader	K.	
	Deputy Environmental	Ir Leung, Jacky, C. H.	9060 2368
	Team Leader		
	Ecologist	Mr. Liu, Vincent, W. L.	6505 5827

1.3. SCOPE OF REPORT

- 1.3.1 This is the 13th monthly EM&A Report under the Contract No. 3/WSD/15 In-situ Reprovisioning of Sha Tin Water Treatment Works (South Works) Advance Works covering the period from 1 March 2017 to 31 March 2017 (the reporting period).
- 1.3.2 The EM&A requirements for impact monitoring are set out in the approved EM&A Manual. Environmental aspects such as the construction air quality, noise, water quality and ecology were identified as the key issues during the construction phase of the Project.

1.4. SUMMARY OF CONSTRUCTION WORKS

- 1.4.1 The construction phase of the Contract commenced on 30 October 2015. Latest construction programmes is shown in **Appendix C**.
- 1.4.2 As informed by the Contractor, details of the major works carried out in this reporting month are listed below:
 - Site clearance and site formation works at Logistics Centre area.
 - Construction of bored pile for Wall C and D.
 - Construction of Valve Chamber at Wall D
 - Modification of clarifier no.1
 - Site formation works for North Works Temporary Power House
 - Laying of storm water drain and construct box culvert at Tin Sum Nullah
- 1.4.3 The locations of the construction activities are shown in **Appendix D**. The Environmental Sensitive Receivers in the vicinity of the Project are shown in **Appendix E**.

2. EM&A RESULTS

2.1. EM&A BACKGROUND

2.1.1 The EM&A programme required environmental monitoring for air quality, noise, water quality and ecology as well as environmental site inspections for air quality, noise, water quality, waste management and ecology impacts. The EM&A requirements and related findings for each component are summarized in the following sections. A summary of impact monitoring programme is presented in Table 2-1.

Table 2-1: Summary of Impact Monitoring Programme

Impact Monitoring	Sampling Parameter	Frequency
Air Quality	1-hour TSP	3 times in every 6 days when documented and valid complaint was received
Noise	$L_{\rm eq~30~min}, L_{\rm eq~5~min}, \\ L_{10} \mbox{ and } L_{90} \mbox{ as reference}.$	1 time per week:
Water Quality	Duplicate in-situ measurements: Dissolved Oxygen (DO), Turbidity and pH; HOKLAS-accredited laboratory analysis: Suspended Solids (SS).	3 days per week. The interval between 2 monitoring days will be more than 36 hours.
Ecology	-	A detailed at least 6 years post-planting monitoring and maintenance programme

Remark: Sampling Depth for Water Quality:

- (i) 3 depths: 1m below water surface, 1m above bottom and at mid-depth when the water depth exceeds 6m.
- (ii) If the water depth is between 3m and 6m, 2 depths: 1m below water surface and 1m above bottom.
- (iii) If the water depth is less than 3m, 1 sample at mid-depth is taken
- 2.1.2 A summary of the monitoring parameters is presented in Table 2-2.

Table 2-2: Summary of the monitoring parameters of EM&A Requirements

Environmental Issue	Parameter	
Air Quality	1-hour TSP Monitoring by Real-Time Portable Dust Meter	
Noise	L _{eq (30min)} during normal working hours	
	In-situ measurement	
	 Dissolved Oxygen (mg/L); 	
	 Dissolved Oxygen Saturation (%); 	
	• Turbidity (NTU);	
Water Quality	pH value;	
•	• Water depth (m); and	
	● Temperature (°C)	
	Laboratory analysis	
	 Suspended Solids (mg/L) 	

- 2.1.3 Summary of determination of Action/Limit (A/L) Levels for air quality, noise and water quality are presented in **Appendix F**.
- 2.1.4 Should non-compliance of the environmental quality criteria occurs, remedial actions will be triggered according to the Event and Action Plan enclosed in **Appendix G**.
- 2.1.5 The impact monitoring schedules are presented in **Appendix H** and the monitoring results are detailed in the following sub-sections.

2.2. AIR QUALITY MONITORING

- 2.2.1 Impact monitoring for air quality had been carried out in accordance with Sections 2.29 of the approved EM&A Manual to determine the ambient 1-hour total suspended particulates (TSP) levels at the monitoring locations. 1-hour TSP sampling should be undertaken at least 3 times in every six-days at each monitoring station when the highest dust impacts are expected. General meteorological conditions (wind speed, direction and precipitation) and notes regarding any significant adjacent dust producing sources had also been recorded throughout the impact monitoring period.
- 2.2.2 Two (2) designated monitoring stations, AM1 located at the L Louey and AM2 located at Hin Keng Estate Hin Wan House, were recommended in Section 2.18 of the approved EM&A Manual. In order to identify and seek for the access of the air monitoring locations designated in the EM&A Manual, site visit was conducted among ET, IEC and EPD.
- 2.2.3 During the site visit, all designated air monitoring locations were identified. Details of air monitoring stations are described in Table 2-3. The location plan of air quality monitoring stations is shown in **Appendix I**.

Table 2-3: Location of the Air Quality Monitoring Stations

Air Quality Monitoring Station	Air Sensitive Receiver (ASR) ID in the approved EIA Report	Dust Monitoring Station
AM1	ASR2	The L Louey (at a platform level of about 5m above road level nearby)
AM2	ASR4	Hin Keng Estate - Hin Wan House (at the roof top)

2.2.4 The monitoring equipment using for the air quality impact monitoring was proposed by ET and verified by IEC. 1-hour TSP levels had been measured with direct reading dust meter. It has been demonstrated its capability in achieving comparable results with high volume sampling method as set out in the Title 40 of the Code of Federal Regulations, Chapter 1 (Part 50). The details of equipment using for impact monitoring are listed in Table 2-4 as below.

Table 2-4: Air Quality Impact Monitoring Equipment

Equipment	Model
Portable dust meter – 1-hour TSP	TSI DustTrak Aerosol Monitor Model 8532
Portable Wind Speed Indicator	The Kestrel Pocket Weather Meter

- 2.2.5 The 1-hour TSP meter provides a real time 1-hour TSP measurement based on 90° light scattering. The 1-hour TSP monitor consists of the following:
 - A pump to draw sample aerosol through the optic chamber where TSP is measured;
 - A sheath air system to isolate the aerosol in the chamber to keep the optics clean for maximum reliability; and

- A built-in data logger compatible with based program to facilitate data collection, analysis and reporting.
- 2.2.6 The 1-hour TSP meter was calibrated by the manufacturer prior to purchasing. Zero response of the instrument was checked before and after each monitoring event. Operation of the 1-hour TSP meter followed manufacturer's Operation and Service Manual. A valid calibration certificate is attached in **Appendix J**.
- 2.2.7 In this Reporting Period, a total of seven (7) sampling days perform air quality monitoring at the two designated locations. The results for 1-hour TSP are summarized in Table 2-5 and Table 2-6.

Table 2-5: Summary of 1-hour TSP Monitoring Results – AM1

				1-hour TSP (μg/m³)			
Date	Weather	Start	End	1 st	2 nd	3 rd	
		Time	Time	Measurement	Measurement	Measurement	
1/3/2017	Cloudy	08:53	11:53	173	181	166	
6/3/2017	Sunny	12:30	15:30	173	181	166	
10/3/2017	Sunny	08:51	11:51	169	174	188	
15/3/2017	Sunny	08:56	11:56	181	176	180	
20/3/2017	Cloudy	13:40	16:40	167	172	175	
24/3/2017	Sunny	09:08	12:08	187	199	185	
29/3/2017	Sunny	09:13	12:13	201	191	184	
	Average				179.5		
	Range				166-201	_	

Table 2-6: Summary of 1-hour TSP Monitoring Results – AM2

		1-hour TSP (μg/m³)				
Date	Weather	Start	End	1 st	2 nd	3 rd
		Time	Time	Measurement	Measurement	Measurement
1/3/2017	Cloudy	13:00	16:00	156	169	160
6/3/2017	Sunny	12:51	15:51	162	156	157
10/3/2017	Sunny	13:58	16:58	158	146	152
15/3/2017	Sunny	12:55	15:55	177	162	158
20/3/2017	Cloudy	07:57	10:57	168	154	155
24/3/2017	Sunny	12:47	15:47	166	143	148
29/3/2017	Sunny	13:00	16:00	170	153	162
Average				158.7		
	Range				143-177	<u>-</u>

2.2.8 In this Reporting Month, all monitoring result were below the action level. Hence, no Action or Limit Level exceedance was triggered during this month. The impact air quality monitoring results and graphical presentation are shown in **Appendix K**.

2.3. NOISE MONITORING

- 2.3.1 Impact monitoring for noise levels had been measured in accordance with Sections 3.13 of approved EM&A Manual on normal weekdays at a frequency of once a week at logging interval of 30 minutes for daytime (between 0700 and 1900 hours of normal weekdays). The L_{eq} had been recorded at the specified intervals. The non-project related construction activity Sha Tin to Central Link (SCL) for Hin Keng to Diamond Hill Tunnel, in the vicinity of the monitoring stations during the impact monitoring had been noted and the source and location of this activity had been recorded.
- 2.3.2 According to Section 3.7 of the approved EM&A Manual, 3 noise sensitive receivers designated for the construction noise monitoring. The designated monitoring stations are identified and successfully granted by the premises. The details of noise monitoring stations are described in Table 2-7 and the location plan of noise monitoring stations is shown in **Appendix L**.

Table 2-7: Details of Noise Monitoring Stations

Noise Monitoring Station	Noise Sensitive Receiver (NSR) ID in the approved EIA Report	Identified Noise Monitoring Station			
		The L Louey (South) (at a platform level of			
NM1	HK2	about 5m above road level nearby			
		- free field measurement)			
		Hin Keng Estate –			
NM2	HK5	Hin Wan House			
		(at the roof level - facade measurement)			
		C.U.H.K.F.A.A.			
NM3	HK7	about 5m above road level nearby - free field measurement) Hin Keng Estate — Hin Wan House (at the roof level - facade measurement)			
		(at the roof level - free field measurement)			

2.3.3 The monitoring equipment using for the noise impact monitoring was proposed by ET and verified by IEC. Sound level meter in compliance with the International Electrotechnical Commission Publications 651: 1979 (Type 1) and 804: 1985 (Type 1) specifications has been used for carrying out the noise monitoring. The sound level meter has been checked using an acoustic calibrator. The wind speed has been checked with a portable wind speed meter capable of measuring the wind speed in m/s. The details of equipment using for impact monitoring are listed in Table 2-8 as below.

Table 2-8: Noise Impact Monitoring Equipment

Noise	
Sound Level Meter	Pulsar 43 Sound level meter
Acoustic Calibrator	Sound Calibrator Pulsar 105
Portable Wind Speed Indicator	The Kestrel Pocket Weather Meter

- 2.3.4 All noise measurements were the meter set to FAST response and on the A-weighted equivalent continuous sound pressure level (L_{eq}).
- 2.3.5 Prior to the impact noise measurement, the accuracy of the sound level meter was checked using an acoustic calibrator generating a known sound pressure level at a known frequency. Regular checking was conducted in impact monitoring period. The calibration level before and after the noise measurement is agreed to within 1.0 dB.
- 2.3.6 An acoustic calibrator and sound level meter using impact monitoring is within the valid period and were calibrated per year. A set of valid calibration certificates is attached in Appendix M.
- 2.3.7 Noise measurements should not be made in presence of fog, rain, wind with a steady speed exceeding 5 ms⁻¹ or wind with gusts exceeding 10 ms⁻¹. The wind speed was checked with a portable wind speed meter capable of measuring with speeds in ms⁻¹.
- 2.3.8 In this Reporting Period, a total seven (7) occasions noise monitoring was undertaken in Reporting period. The noise monitoring results at the designated locations are summarized in Tables 2-9 to 2-11.

Table 2-9: Summary of Noise Monitoring Results – NM1

Data	Date Weather	Start Time	1 st	2 nd	3 rd	4 th	5 th	6 th	Lag
Date		Start Time	Leq _{5min}	Leq _{30min}					
1/3/2017	Cloudy	10:01-10:31	65.9	66.4	64.8	67.1	66.0	65.8	66.1
6/3/2017	Sunny	14:40-15:10	65.8	65.7	66.2	67.4	66.9	67.3	66.6
10/3/2017	Sunny	14:38-15:08	66.8	67.3	65.9	64.9	65.5	66.0	66.1
15/3/2017	Sunny	14:07-14:37	65.7	65.8	66.0	67.9	68.2	68.0	67.1
20/3/2017	Cloudy	09:57-10:27	68.3	67.5	66.9	67.1	65.3	65.0	66.8
24/3/2017	Sunny	14:59-15:29	67.7	67.8	67.3	66.5	66.8	67.0	67.2
29/3/2017	Sunny	14:21-14:51	65.4	65.0	66.0	66.2	67.3	68.0	66.4
Limit Loyal >75dP(A)							Average	66.6	
Limit Level	Limit Level >75dB(A)				•			Range	66.1-67.2

Table 2-10: Summary of Noise Monitoring Results – NM2

Doto Woothon		Ctout Times	1 st	2 nd	3 rd	4 th	5 th	6 th	T an
Date	Weather	Start Time	Leq _{5min}	$\text{Leq}_{30\text{min}}$					
1/3/2017	Cloudy	10:44-11:14	55.7	56.4	57.0	54.9	55.2	57.5	56.2
6/3/2017	Sunny	15:21-15:51	55.5	57.1	56.4	57.2	54.8	55.2	56.1
10/3/2017	Sunny	15:20-15:50	57.3	56.4	58.0	56.6	57.1	56.0	56.9
15/3/2017	Sunny	14:51-15:21	56.6	57.2	55.8	58.3	56.0	55.8	56.7
20/3/2017	Cloudy	10:40-11:10	58.0	57.5	55.7	56.2	56.3	57.1	56.9
24/3/2017	Sunny	15:41-16:11	56.9	57.1	56.7	57.0	56.3	55.7	56.6
29/3/2017	Sunny	15:06-15:36	57.0	58.1	56.4	56.9	57.0	55.8	56.9
Limit Loyal >75dD(A)			•	•	•		Average	56.6	
Lillit Level	Limit Level >75dB(A)							Range	56.1-56.9

Table 2-11: Summary of Noise Monitoring Results – NM3

D-4-	XX741	C44 TC*	1 st	2 nd	3 rd	4 th	5 th	6 th	Tas
Date	Weather	Start Time	Leq _{5min}	Leq _{30min}					
1/3/2017	Cloudy	11:28-11:58	54.8	55.6	55.9	57.3	56.4	55.8	56.0
6/3/2017	Sunny	16:07-16:37	58.1	56.7	56.8	56.0	57.4	56.6	57.0
10/3/2017	Sunny	16:13-16:43	56.5	56.8	57.1	57.3	56.9	56.5	56.9
15/3/2017	Sunny	15:43-16:13	55.5	56.7	56.4	57.0	58.0	56.9	56.8
20/3/2017	Cloudy	11:25-11:55	56.0	55.2	57.0	56.7	55.3	57.1	56.3
24/3/2017	Sunny	16:27-16:57	56.0	56.8	57.0	56.3	55.2	55.4	56.2
29/3/2017	Sunny	15:50-16:20	55.5	56.4	56.4	57.0	55.6	54.8	56.0
70dD(A)	Limit Level 70dB(A) during normal teaching periods							Average	56.5
and 65 dB(A) during examination periods							Range	56.0-57.0	

2.3.9 As shown in the results were well below the limit level, also no complaint was received by the RE, WSD, EPD and contractor. Hence, no Action or Limit Level exceedance was triggered during this month. The impact noise quality monitoring results and graphical presentation are shown in **Appendix N**.

2.4. WATER QUALITY MONITORING

- 2.4.1 Water Impact monitoring had been taken three days per week with sampling or measurement in accordance with Sections 4.12 of the approved EM&A Manual at all designated monitoring stations in the 2 water courses. The interval between 2 sets of monitoring had been more than 36 hours. Replicate in-situ measures had been carried out in each sampling event.
- 2.4.2 Three (3) control and two (2) impact stations were recommended in the Section 4.7 of the approved EM&A Manual to carry out water quality monitoring. In order to identify and seek for the access of the water monitoring locations designated in the approved EM&A Manual, site visit was conducted among ET, IEC and Environmental Protection Department (EPD).
- 2.4.3 During the site visit, all designated monitoring locations were identified however one more impact stations (M3) along the same water course was introduced due to the concern on multiple site effect, in particular to address the potential impact to M2 from a source at upstream of the water course. Details and coordinates of the monitoring stations are described in Table 2-12 and the location plan of water quality monitoring stations is shown in **Appendix O**.

Table 2-12: Details of Water Quality Monitoring Station

Water Quality Monitoring	Description	Co-or	dinates
Station	Description	Easting	Northing
C1		835110	824716
C2	Control Stations	835403	824470
C3		835642	824386
M1	Lunnost	835215	824827
M2	Impact Monitoring Stations	835536	824775
M3	Wollitoring Stations	835501	824648

2.4.4 The water monitoring equipment and analysis using for the water quality monitoring were proposed by ET and verified by IEC. The details of equipment using for impact monitoring are listed in the Table 2-13 below:

Table 2-13: Monitoring Equipment Used in Impact Monitoring Program

Water quality	
YSI Model ProDSS Multi-para	ameter Water Quality Monitoring System
Thermometer & DO meter	The instrument is a portable and weatherproof dissolved oxygen (DO) measuring instrument complete with cable and sensor, and use a DC power source. The equipment is capable of measuring as included a DO level in the range of 0 - 20mg/L and 0 - 200% saturation; and a temperature of 0 - 45°C.
pH meter	The instrument consists of a potentiometer, a glass electrode, a reference electrode and a temperature-compensating device. It is readable to 0.1 pH in range of 0 to 14.
Turbidmeter	The instrument is a portable and weatherproof turbidity measuring instrument using a DC power source. It has a photoelectric sensor capable of measuring turbidity between 0 - 1000 NTU.
Laboratory Analysis	
Suspended Solids	HOKLAS-accredited laboratory (Acumen Laboratory and Testing Limited)

Remark:

- (i) Water samples for suspended solids (SS) have been stored in high density polythene bottles with no preservative added, packed in ice (cooled to 4°C without being frozen).
- 2.4.5 Before the commencement of the sampling, general information such as the date and time of sampling as well as the personnel responsible for monitoring were recorded on the monitoring field data sheet.
- 2.4.6 Water temperature, turbidity, DO, pH and water depth were measured in-situ. Since water depths at C1, C2, M1, M2 and M3 were less than 3 m, all in-situ measurements and sampling conducted at one water depth such as mid-depth are performed. Moreover, C3 was recorded dry throughout the sampling period. Therefore, in-situ measurements and sampling could not be conducted at C3 in accordance with the water monitoring requirements in the approved EM&A Manual.
- 2.4.7 At each sampling point, (two) 2 consecutive measurements of temperature, DO, turbidity and pH were measured. The Multi-Parameter Water Quality Monitoring Probe were retrieved out of the water after the first measurement and then re-deployed for the second measurement. Where the difference in the value between the first and second readings of each set was more than 25% of the value of the first reading, the reading was discarded and further readings were taken. The certification of the Multi-parameter Water Quality Monitoring System is showed in **Appendix P**.
- 2.4.8 All water samples were delivered to the Acumen Laboratory and Testing Limited (HOKLAS registration no.: 241). SS testing was used HOKLAS accredited Analytical method APHA 2540 D. The certification of laboratory with HOKLAS accredited analytical tests are provided in **Appendix Q**.
- 2.4.9 In this reporting period, a total of fourteen (14) sampling days perform water monitoring at the six designated locations. Monitoring results of 4 key parameters: dissolved oxygen (DO), turbidity, suspended solids and pH in this Reporting Months, are summarized in Table 2-14.

Table 2-14: Summary of Water Quality Monitoring Results

Dissolved Oxygen – Mid Depth (mg/L)	C 1	C2	С3	M1	M2	М3
Average	8.11	8.59	N/A	9.07	9.09	9.21
Min.	7.57	8.17	N/A	8.91	8.97	9.17
Max.	8.92	9.10	N/A	9.27	9.22	9.28
Turbidity – Mid Depth (NTU)	C1	C2	C3	M1	M2	M3
Average	2.61	2.80	N/A	2.59	5.73	0.72
Min.	1.30	2.20	N/A	1.10	2.40	0.60
Max.	3.40	3.00	N/A	3.80	8.20	0.90
Suspended Solid – Mid depth (mg/L)	C 1	C2	С3	M1	M2	М3
Average	2.76	2.65	N/A	2.84	5.09	<1
Min.	1.30	2.10	N/A	2.00	4.00	<1
Max.	4.00	3.60	N/A	3.20	5.90	<1
pH value (unit)	C1	C2	C3	M1	M2	M3
Average	7.72	8.22	N/A	7.78	8.31	8.06
Min.	7.42	7.58	N/A	7.21	7.21	7.53
Max.	7.87	8.78	N/A	8.16	9.08	8.59

2.4.10 In this Reporting Month, all monitoring result were below or within the action level. Hence, no Action or Limit Level exceedance was triggered during this month. Detailed monitoring results including in-situ measurements, laboratory analysis data are shown in **Appendix R**.

2.5. ECOLOGY

- 2.5.1 Detailed Vegetation Survey Report and Woodland Compensation Plan submitted to EPD and approved on 17 February 2016. To ensure the planting works are properly implemented, bi-weekly monitoring is proposed throughout the planting phase. The frequency of monitoring is proposed to be bi-monthly during the first years of the planting stage, and then reduced to quarterly for the six (6) year post-planting period.
- 2.5.2 A 6 years post-planting review report will be submitted within a month after completion of the at least 6 years post-planting monitoring and maintenance.
- 2.5.3 A bi-weekly monitoring scheduled on 4 and 18 March 2017 during the Reporting Period. Detailed monitoring report (No. 27 and No. 28) are shown in **Appendix S**.
- 2.5.4 Ailanthus (Ailanthus fordii) and Incense Tree (Aquilaria sinensis) was transplanted to new location within STWTW. The condition of TA572 was observed in fair condition while TA326 and TA327 were in poor condition. Tree crown of TA326 and TA327 was observed thinner than the observation in last observation. Fungi attack (species: Schizophyllum commune) was observed on TA572 during current inspection. Fungicide was recommended to control the growth of fungal attack. In addition, it is recommended to wrap a layer of shelter (such as 遮光網) on tree trunk for TA572 and TA327 in order to reduce the intensity of sunlight. Transplanted Lamb of Tartary (Cibotium barometz) seems to be received too much sunlight. Leaves of them were observed yellowish in colour. Shelter (遮光網) was recommended to reduce the intensity of sunlight. Hong Kong Eagle's Claw was observed dead during inspection on 20 August 2016. New fronds of transplanted Lamb of Tartary were observed growing out. Lamb of Tartary was under recovery after transplantation. Currently, Lamb of Tartary were temporally stored on Nursery garden at Wang Toi Shan, Kam Tin. It is recommended to retain them at the nursery garden under proper maintenance during current recovery stage.
- 2.5.5 In general, all transplanted Lamb of Tartary were in fair condition while Hong Kong Eagle's Claw (Artabotrys hongkongensis) was observed dead during inspection on 20 August 2016 and the survival rate was 96%.
- 2.5.6 In order to compensate for the lost of transplanted Hong Kong Eagle's Claw, it is recommended to plant an individual of native climber species at compensatory planting site (Sha Tin South Fresh Water Service Reservoir (STSFWSR)) together with compensatory tree planting. The suggested species in planting list would have certain ecological value in terms of plant ecology and the associated wildlife including birds.
- 2.5.7 After transplantation, root ball of TA572, TA326 and TA327 tree should be kept moisture especially during dry and non-raining day.

2.6. WASTE MANAGEMENT STATUS

- 2.6.1 The Contractor has submitted application form for registration as chemical waste producer under the Contract. Sufficient numbers of receptacles were available for general refuse collection and sorting. The Waste Producer Number to the Contractor is assigned in respect of the project site.
- 2.6.2 Wastes generated during this reporting period include mainly construction wastes (inert and non-inert). Waste flow table was prepared by the Contractor to record amount of waste generated and disposed (**Appendix T**).
- 2.6.3 The Contractor was advised to properly maintain on site C&D materials and waste collection, sorting and recording system, dispose of C&D materials and wastes at designated ground and maximize reuse/recycle of C&D materials and wastes.
- 2.6.4 The Contractor was also reminded to properly maintain the site tidiness and dispose of the wastes accumulated on site regularly and properly. For chemical waste containers, the Contractor was reminded to treat properly and store temporarily in designated chemical waste storage area on site in accordance with the Code of Practice on the Packaging, Labelling and Storage of Chemical Wastes.

2.7. DELIVERY, STORAGE AND HANDLING OF CHLORINE

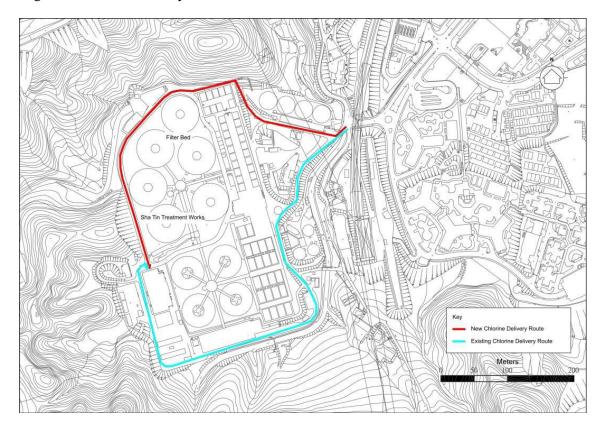
2.7.1 Chlorine is delivered to Sha Tin WTW in batches of up to 6×1-tonne drums. The transport route from Sham Shui Kok dock on North Lantau is shown in **Figure 1**. The route passes along the North Lantau Expressway, around the northern edge of Tsing Yi, through Tsuen Wan and along Tai Po Road (Piper's Hill) to Sha Tin (Table 2-15).

Table 2-15: Chlorine Truck Transport Route

Destination		Route
From	SSK	Sham Shui Kok Dock > Cheung Tung Road > Sunny Bay Road > N Lantau Highway
Dock	to	> Lantau Link > NW Tsing Yi Interchange > Tsing Yi North Costal road > Tsing
Sha	Tin	Tsuen Road > Tsuen Wan Road > Kwai Chung Road > Ching Cheung Road > Tai Po
WTW		Road > Tai Po Road (Piper's Hill) > Tai Po Road (Sha Tin Heights) > Tai Po Road >
		Tsing Sha Highway (Sha Tin) > Tai Po Rd (Sha Tin) > Sha Tin Rural Committee Rd
		> Tai Chung Kiu Rd > Che Kung Miu Road > Sha Tin WTW

- 2.7.2 Unloading takes place inside the Chlorination House, with the doors closed, in a designated truck unloading bay. The movement of drums within the storage area and 'drive-through' unloading bay is carried out using a hoist/monorail system with a purpose-built lifting beam. Prior to usage, the drums are stored on cradles within the chlorine storage area.
- 2.7.3 The on-site chlorine delivery route is shown in Figure 2.

Figure 2: Chlorine Delivery Route at Sha Tin WTW



- 2.7.4 An emergency chlorine scrubbing system is installed to remove any leaked chlorine in the chlorine handling and storage areas. The system is a packed tower utilising sodium hydroxide as the neutralising agent. The plant and equipment are installed in a separate scrubber room.
- 2.7.5 On detection of chlorine at a concentration of 3 ppm or above in the chlorine handling or storage areas, the scrubbing system will activate automatically. The air/chlorine mixture in the affected areas is drawn into the scrubber by the scrubber fan via ducting connected to the normal ventilation system. An electrically-operated isolating damper is provided in the scrubber intake which opens automatically when the scrubber fan starts up.
- 2.7.6 The scrubber system is normally set at auto standby mode and is activated if the chlorine concentration rises above 3 ppm. A continuous chlorine monitor is installed at a point downstream of the packed tower and upstream of the vent/recycle changeover dampers to monitor the scrubber performance; a "Chlorine concentration high" alarm will be initiated if the concentration of chlorine in the tower exhaust exceeds the preset value.
- 2.7.7 According to the Fire Services Department's fire safety requirements, an emergency repair/stoppage kit for chlorine spillage/leakage is provided and maintained in good working condition at all times for use by the trained persons and stowed adjacent to but outside the store/plant room. Regular drills are conducted to train personnel on the proper use of the breathing apparatus and protective clothing.
- 2.7.8 A Hazard Assessment of the risks associated with the storage, handling and transport of chlorine at Sha Tin WTW and the off-site transport of chlorine for the Construction and Operational Phases of the reprovisioning project has been conducted in the approved EIA Report (Register No. AEIAR-187/2015).
- 2.7.9 This In-situ Reprovisioning of Sha Tin WTW is an improvement project, following its completion the chlorine-related risks levels to the general public will be lowered due to the anticipated reduction of the chlorine storage and usage levels.
- 2.7.10 Implementation of the recommended mitigation measures would be regularly audited. No specific Environmental Monitoring would be required.

2.8. EM&A SITE INSPECTION

- 2.8.1 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, five (5) site inspections were carried out on 3, 10, 17, 24 & 31 March 2017.
- 2.8.2 One joint site inspection with IEC also undertaken on 24 March 2017. Minor deficiencies were observed during weekly site inspection or joint site inspection. Key observations during the site inspections are summarized in Table 2-16.

Table 2-16: Site Observations

Date	Environmental Observations	Follow-up Status
3 March 2017	The Contractor was reminded to update the upcoming construction schedule regularly. Contractor was reminded to spray water on access road at Wall D regularly.	Reminder only.
10 March 2017	No environmental issue was observed during the site inspection	N/A
17 March 2017	The Contractor was reminded to update the upcoming construction schedule regularly.	Reminder only.
24 March 2017	Observation(s) and Recommendation(s) The Contractor was reminded to display the NRMM Label for a generator at Wall D	The exempted NRMM Label for the generator was securely fixed on the machine and displayed at a conspicuous position.
31 March 2017	Refuse was found in drainage.	Reminder only.

2.8.3 The Contractor has rectified all of the observations identified during environmental site inspections in the reporting period.

2.9. ENVIRONMENTAL LICENSES AND PERMITS

2.9.1 The status of environmental license and permit is summarized in Table 2-17 below:

Table 2-17: Summary of Environmental License and Permit

License / Permit	License /	Date of	Date of	License /	Remark
	Permit No.	Issue	Expiry	Permit	
				Holder	
Environmental Permit	EP- 494/2015	28/1/2015	N/A	WSD	
Registration of Chemical	WPN5218-759	31/12/2015	N/A	MMVJV	
Waste Producer	-M2936-01				
Trip Ticket (Chit)	7023723	10/12/2015	N/A	MMVJV	
Account					
Waste Water Discharge	WT0023932	1/4/2016	31/3/2021	MMVJV	
License (Wall C)	-2016				
Waste Water Discharge	WT0024211	10/6/2016	30/6/2021	MMVJV	
License (Wall D)	-2016				
Construction Noise Permit	GW-RN0906-16	6/12/2016	7/6/2017	MMVJV	

2.10. IMPLEMENTATION STATUS OF ENVIRONMENTAL MITIGATION MEASURES

- 2.10.1 In response to the site audit findings, the Contractors carried out corrective actions. A summary of the environmental mitigation measures implemented by the Contractor in this Reporting Period are summarized in Table 2-18.
- 2.10.2 The environmental mitigation measures that recommended in the Implementation Schedule for Environmental Mitigation Measures (EMIS) in the approved EM&A Manual covered the issues of dust, noise, water and waste and they are showed **Appendix U**.

Table 2-18: Environmental Mitigation Measures

Issues	Environmental Mitigation Measures
	- Tarpaulin covering of any dusty materials on a vehicle leaving the site;
	- Imposition of speed controls for vehicles on site haul roads;
	- Use of regular watering to reduce dust emissions from exposed site
Air Quality	surfaces and roads;
All Quality	- Side enclosure and covering of any aggregate or stockpiling of dusty materials to reduce emissions;
	- Where possible, routing of vehicles and positioning of construction
	plant should be at the maximum possible distance from ASRs.
	- Good site practices to limit noise emissions at the sources;
	- Use of quite plant and working methods;
Noise	- Use of site hoarding or other mass materials as noise barrier to screen noise at ground level of NSRs;
	- Scheduling of construction works outside school examination period in critical area.
	- Drainage systems were regularly and adequately maintained;
Water	- Effluent discharged from the construction site should comply with
vvalei	standards stipulated in the TM-DSS;
	- Open stockpiles of construction materials on sites should be covered.
General	- The site was generally kept tidy and clean.

2.10.3 The necessary mitigation measures were implemented properly for this Contract.

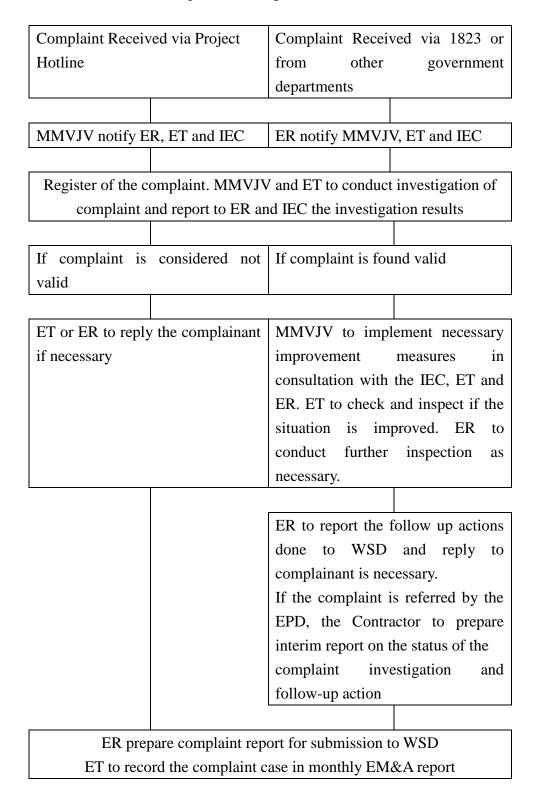
2.11. SUMMARY OF EXCEEDANCES OF THE ENVIRONMENTAL QUALITY PERFORMANCE LIMIT

- 2.11.1 Results for 1-hour TSP, noise and water quality monitoring complied with the Action/ Limit levels in the reporting period.
- 2.11.2 Cumulative statistics on exceedances is provided in **Appendix V**.

2.12. SUMMARY OF COMPLAINTS, NOTIFICATION OF SUMMONS AND PROSECUTIONS

2.12.1 The Environmental Complaint Handling Procedure is shown in below table:

Table 2-19: Environmental Complaint Handling Procedure



- 2.12.2 No environmental complaint were received in the reporting period.
- 2.12.3 No notification of summons and prosecution was received in the reporting period.
- 2.12.4 Statistics on complaints, notifications of summons and successful prosecutions are summarized in **Appendix V**.

2.13. DATA MANAGEMENT AND DATA QA/QC CONTROL

- 2.13.1 The impact monitoring data were handled by ET's in-house data recording and management system.
- 2.13.2 The monitoring data recorded in the equipment were downloaded directly from the equipment at the end of each monitoring day. The downloaded monitoring data were input into computerized database properly. The laboratory results were input directly into the computerized database and checked by personnel other than those who had input the data.
- 2.13.3 For monitoring parameters that require laboratory analysis, the local laboratory had followed the QA/QC requirements as set out under the HOKLAS scheme for the relevant laboratory testing.

3. FUTURE KEY ISSUES

3.1. CONSTRUCTION PROGRAMME FOR THE COMING MONTHS

- 3.1.1 As informed by the Contractor, the major works for this Project in April 2017 to June 2017 will be:
 - Construction of valve chamber at Wall D
 - Site clearance and site formation works at Logistics Centre area.
 - Construction of bored pile for Wall C and Wall D.
 - Modification of clarifier no.1
 - Site formation works for North Works Temporary Power House
 - Laying of storm water drain and construct box culvert at Tin Sum Nullah

3.2. KEY ISSUES FOR COMING MONTH

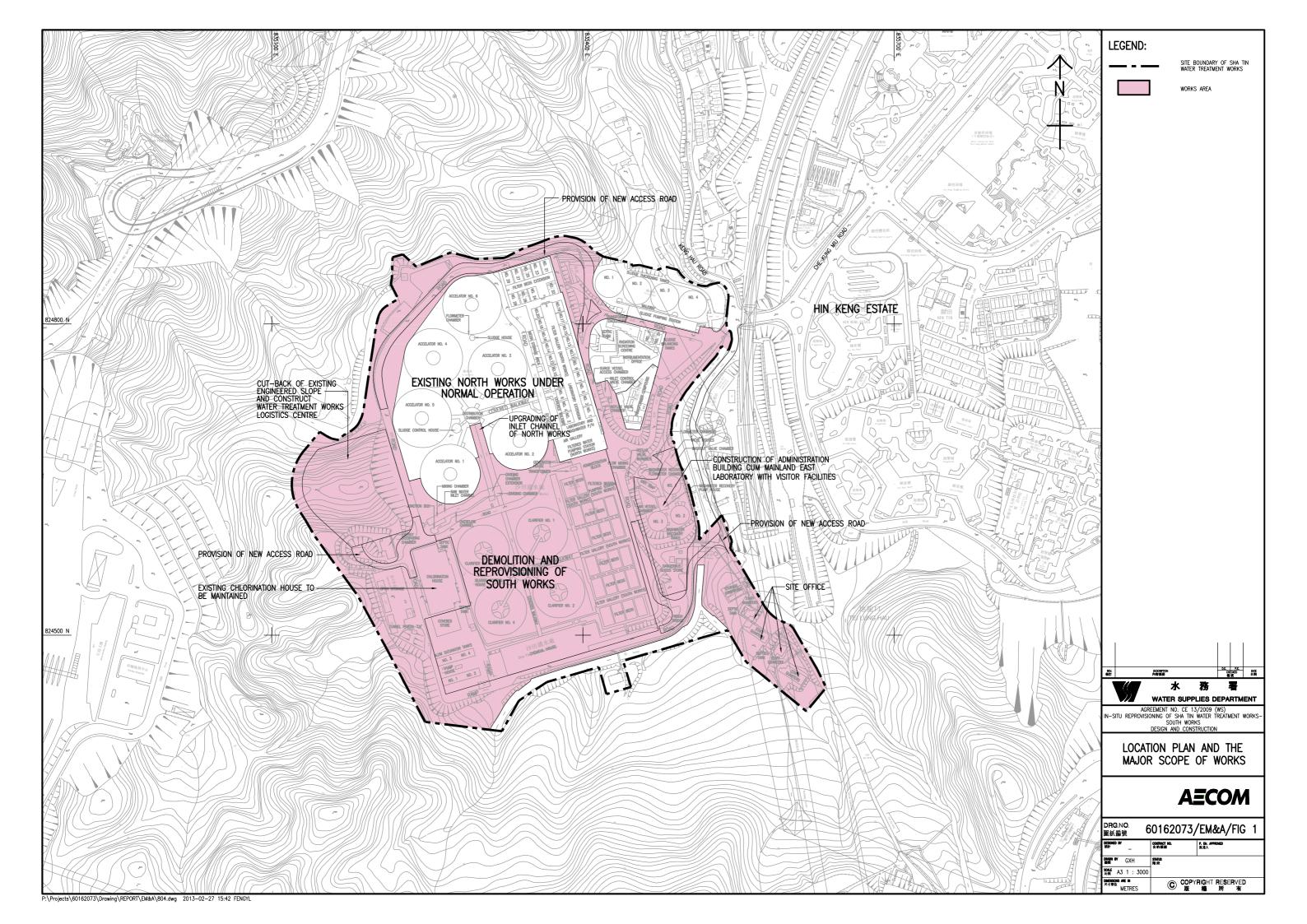
- 3.2.1 Potential environmental impacts arising from the above upcoming construction activities in April 2017 are mainly associated with dust, noise, water quality issues and waste management issues.
- 3.2.2 Particular issues to be considered in the coming month include:
 - Implementation of dust suppression measures at all times.
 - Implementation of adequate measures to prevent discharge of site effluent to the nearby water bodies
 - Desilting tanks and catch-pits should be regularly maintained.
 - Implementation of construction noise preventative control measures.
- 3.2.2 The tentative monitoring schedule for April 2017 to June 2017 can be found in **Appendix W**.

4. CONCLUSIONS AND RECOMMENDATIONS

4.1. SUMMARY

- 4.1.1 Air quality (including 1-hour TSP), noise, water quality and ecology impact monitoring were carried out in the reporting period. All monitoring results are satisfactory and no NOEs or associated corrective action was therefore issued.
- 4.1.2 Five (5 nos.) environmental site inspection were conducted during the reporting period. Joint site inspection with IEC were carried out on 24 March 2017. Minor deficiencies were observed during site inspection and were rectified within the specified deadlines. The environmental performance of the Project was therefore considered satisfactory.
- 4.1.3 To control the site performance on waste management, the contractor shall ensure that all solid and liquid waste management works are fully in compliance with the relevant license/permit requirements, such as the effluent discharge licence and the chemical waste producer registration. Contractor is also reminded to implement the recommended environmental mitigation measures according to the Environmental Monitoring and Audit Manual.
- 4.1.4 No environmental complaint were received in the reporting period.
- 4.1.5 No notification of summons or prosecution was received since commencement of the Contract.
- 4.1.6 The ET will keep track on the construction works to confirm compliance of environmental requirements and the proper implementation of all necessary mitigation measures.

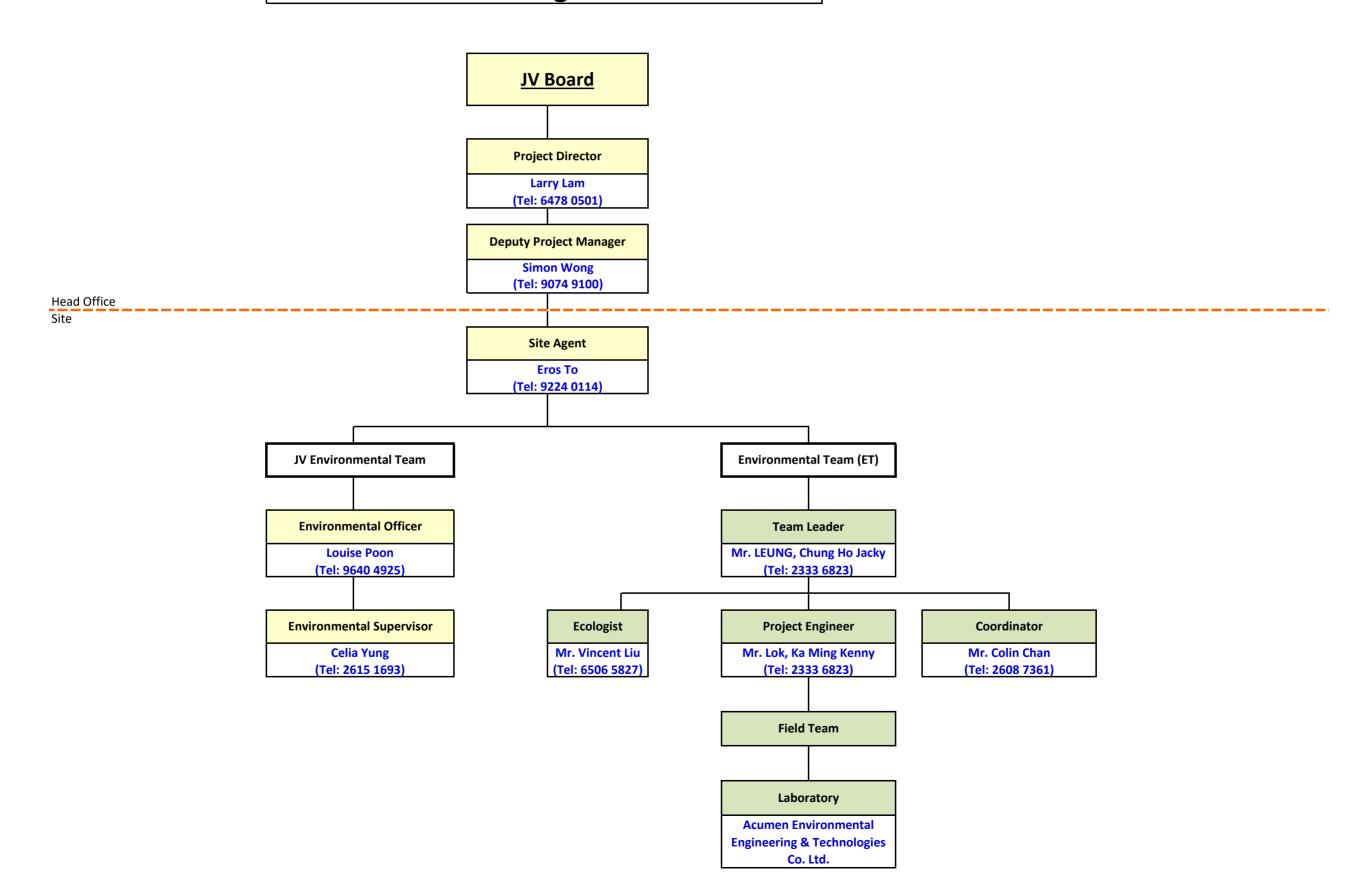
Appendix A General Layout Plan



Appendix B Project Organization

Update Date: 1/2/2017

Environmental Organization Chart



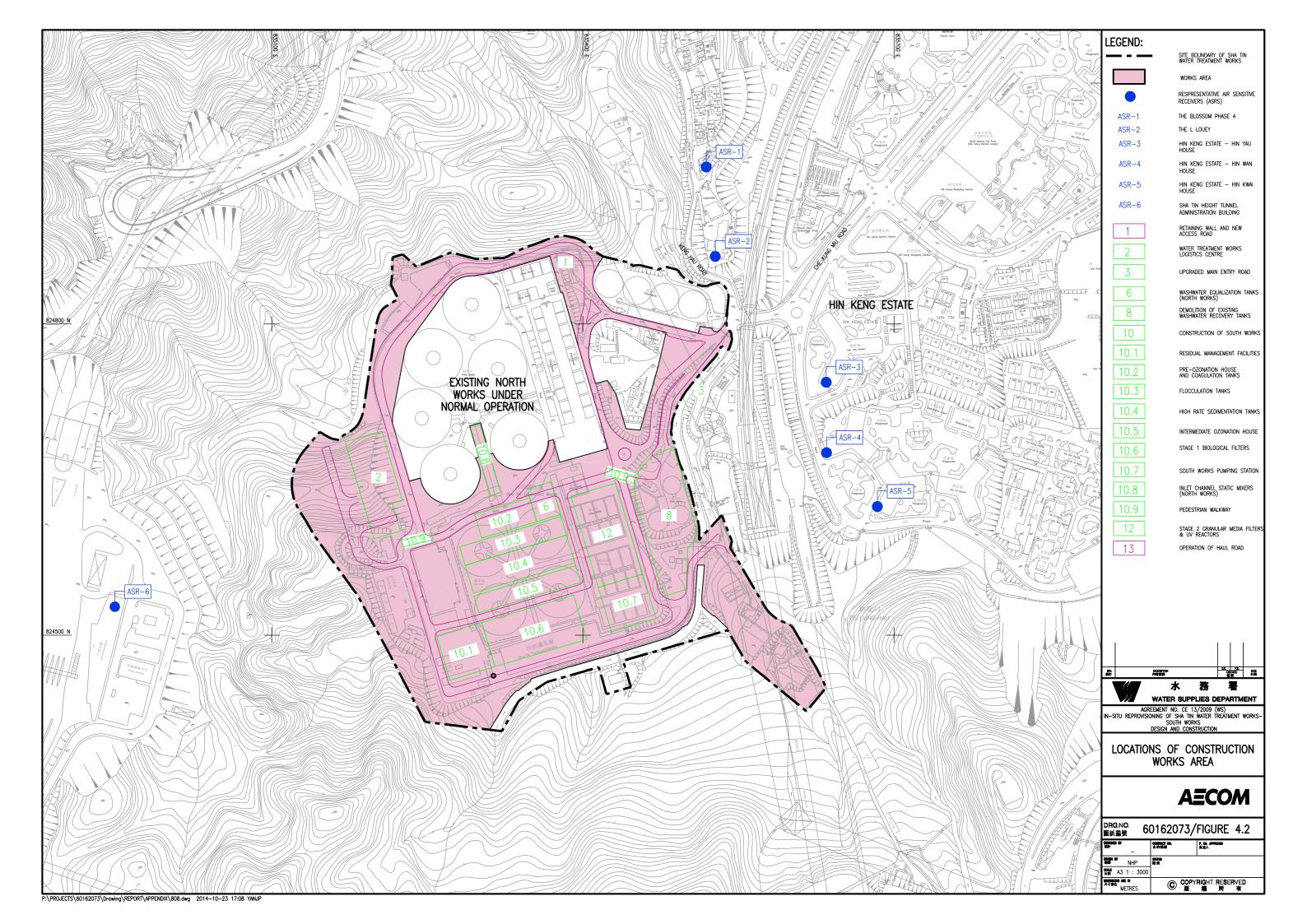
Appendix C Latest Construction Programme

Three Months Rolling Programme (From Mar 2017 to May 2017)

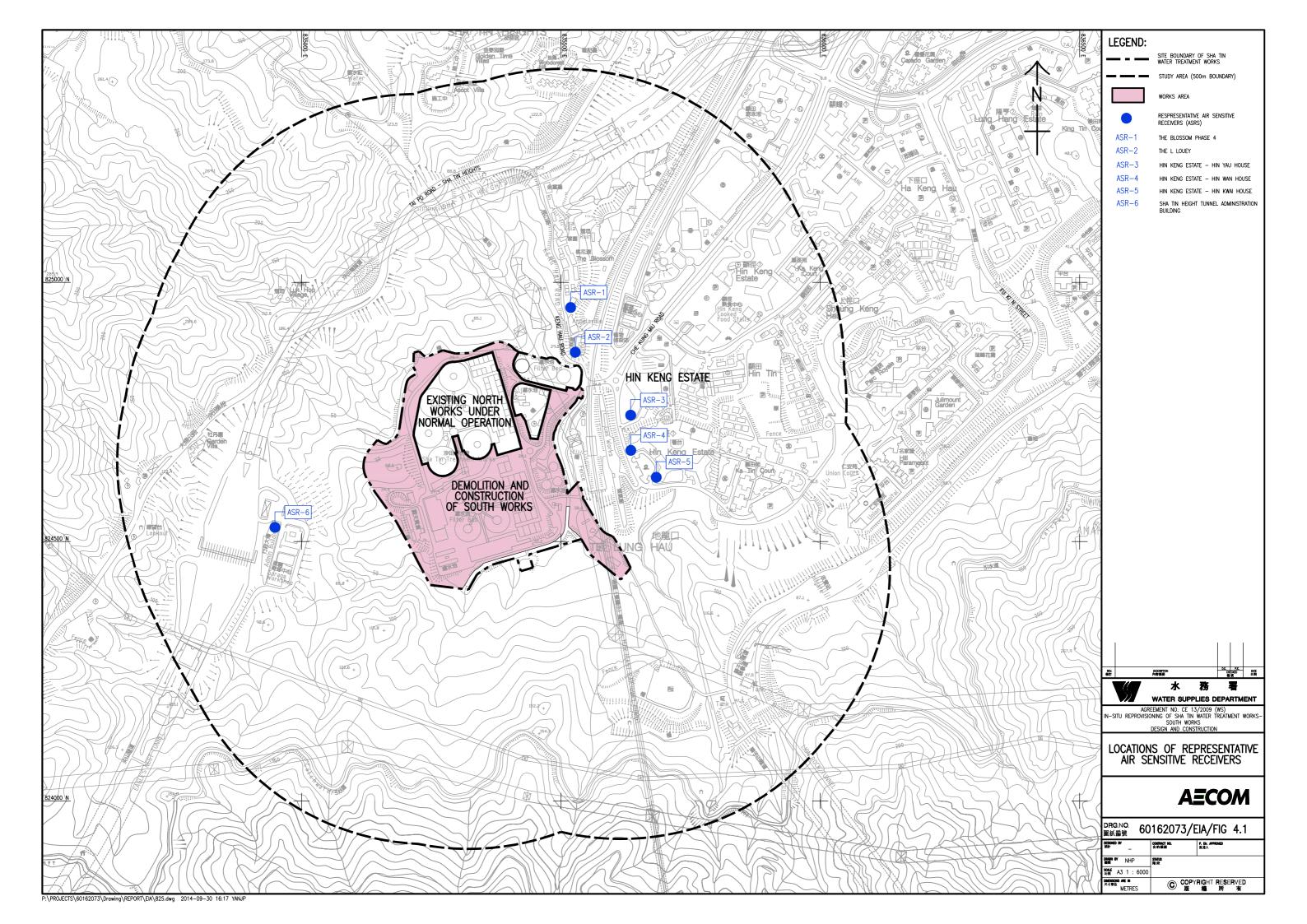


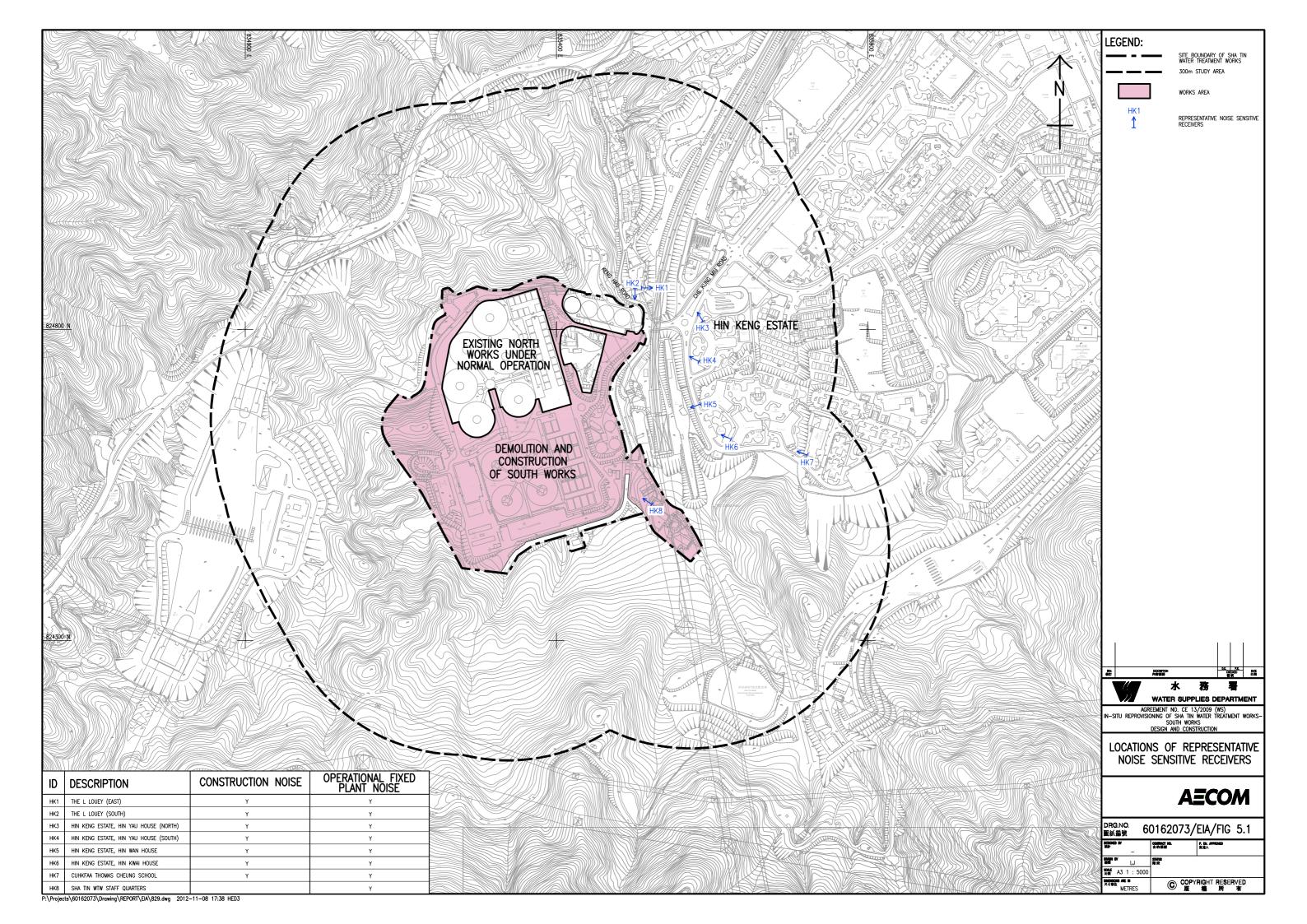
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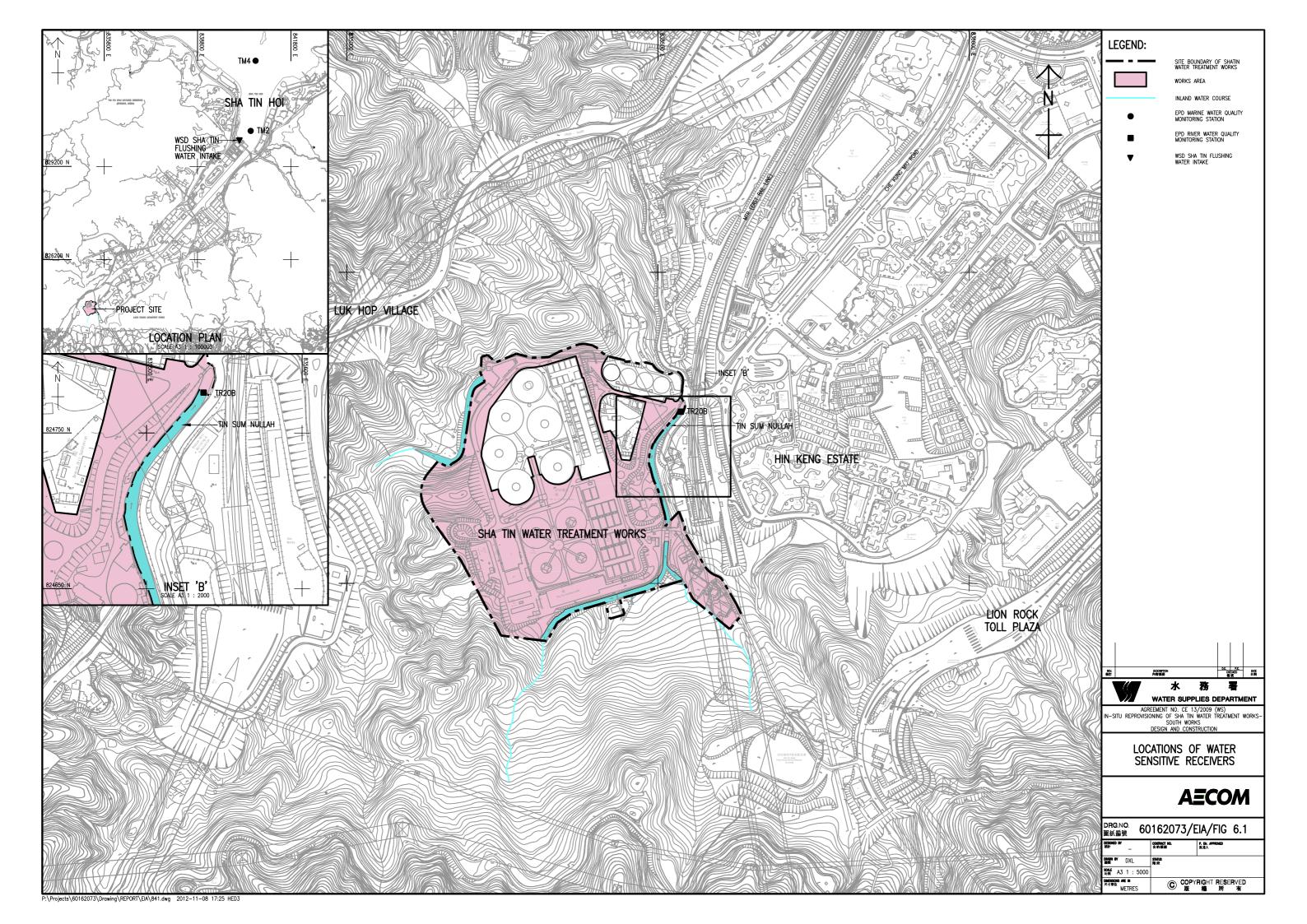
Appendix D Location of Construction Activities



Appendix E Environmental Sensitive Receivers in the Vicinity of the Project







Appendix F Summary of Action and Limit Levels

Determination of Action and Limit Levels for Air Quality

Monitoring Locations	Action Level 1-hour TSP, (μg/m³)	Limit Level 1-hour TSP, (μg/m³)		
AM1	357	500		
AM2	334	500		

Determination of Action and Limit Levels for Noise

Monitoring	Action Level	Limit Level in dB(A)			
Location	0700-1900 hours on normal weekdays				
NM1		For domestic premises: 75 dB(A) for			
NM2	complaint is received	NM1 & NM2			
NM3		For schools: 70dB(A) during normal teaching periods and 65 dB(A) during examination periods for NM3			

Determination of Action and Limit Levels for Water Quality

Water		d Oxygen g/L)	Suspender (mg/		Turbidity	(NTU)	pl	Н
monitoring stations	Action	Limit	Action	Limit	Action	Limit	Action	Limit
stations	Level	Level	Level	Level	Level	Level	Level	Level
C1	7.51	7.44	4.19	6.73	3.99	4.00	Beyond the range 6.6 to 7.9	Beyond the range 6.5 to 8.0
C2	8.10	7.98	4.33	8.16	3.13	3.28	Beyond the range 6.6 to 8.8	Beyond the range 6.5 to 8.9
C3*	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
M1	8.90	8.89	3.30	3.56	4.36	4.48	Beyond the range 6.6 to 8.2	Beyond the range 6.6 to 8.3
M2	8.92	8.91	18.84	26.80	12.64	13.72	Beyond the range 6.6 to 11.0	Beyond the range 6.6 to 11.0
M3	9.16	9.15	1.00	1.00	1.10	1.18	Beyond the range 6.6 to 8.6	Beyond the range 6.6 to 8.7

Remark: For DO, action should be taken when monitoring result of either one of the surface, middle or bottom DO is lower than the proposed Action/Limit Levels.

Appendix G Event/Action Plan

Air Quality

FV/FNT		ACT	TION	
EVENT	ET	IEC	ER	CONTRACTOR
ACTION LEVEL				
1. Exceedance for one	1. Inform the Contractor, IEC	Check monitoring data	1. Confirm receipt of	1. Identify source(s),
sample	and ER;	submitted by the ET;	notification of exceedance	investigate the causes of
	2. Discuss with the	2. Check Contractor's	in writing.	exceedance and propose
	Contractor on the remedial	working method; and		remedial measures;
	measures required;	3. Review and advise the ET		2. Implement remedial
	3. Repeat measurement to	and ER on the effectiveness		measures; and
	confirm findings; and	of the proposed remedial		3. Amend working methods
	4. Increase monitoring	measures.		agreed with the ER as
	frequency.			appropriate.
2. Exceedance for two or	1. Inform the Contractor, IEC	Check monitoring data	1. Confirm receipt of	1. Identify source and
more consecutive samples	and ER;	submitted by the ET;	notification of exceedance	investigate the causes
	2. Discuss with the ER and	2. Check Contractor's	in writing;	of exceedance;
	Contractor on the remedial	working method; and	2. Review and agree on the	2. Submit proposals for
	measures required;	3. Review and advise the ET	remedial measures proposed	remedial measures to
	3. Repeat measurements to	and ER on the effectiveness	by the Contractor; and	the ER with a copy to
	confirm findings;	of the proposed remedial	3. Supervise implementation	ET and IEC within three
	4. Increase monitoring	measures.	of remedial measures.	working days of notification;
	frequency to daily;			3. Implement the agreed
	5. If exceedance continues,			proposals; and

	arrange meeting with the			4. Amend proposal as
	IEC, ER and Contractor; and			appropriate.
	6. If exceedance stops,			
	cease additional monitoring.			
LIMIT LEVEL				
Event	ET	IEC	ER	CONTRACTOR
1. Exceedance for one	1. Inform the Contractor,	Check monitoring data	1. Confirm receipt of	1. Identify source(s) and
sample	IEC, EPD and ER;	submitted by the ET;	notification of exceedance	investigate the causes
	2. Repeat measurement to	2. Check the Contractor's	in writing;	of exceedance;
	confirm findings;	working method;	2. Review and agree on the	2. Take immediate action to
	3. Increase monitoring	3. Discuss with the ET, ER	remedial measures proposed	avoid further exceedance;
	frequency to daily; and	and Contractor on possible	by the Contractor; and	3. Submit proposals for
	4. Discuss with the ER, IEC	remedial measures; and	3. Supervise implementation	remedial measures to ER
	and contractor on the	4. Review and advise the ER	of remedial measures.	with a copy to ET and IEC
	remedial measures and	and ET on the effectiveness		within three working days of
	assess the effectiveness.	of Contractor's remedial		notification;
		measures.		4. Implement the agreed
				proposals; and
				5. Amend proposal if
				appropriate.

	ET	IEC	ER	CONTRACTOR
2. Exceedance for two or	1. Notify Contractor, IEC, EPD	1. Check monitoring data	1. Confirm receipt of	1. Identify source(s) and
more consecutive samples	and ER;	submitted by the ET;	notification of exceedance	investigate the causes of
	2. Repeat measurement to	2. Check the Contractor's	in writing;	exceedance;
	confirm findings;	working method;	2. In consultation with the ET	2. Take immediate action
	3. Increase monitoring	3. Discuss with ET, ER, and	and IEC, agree with the	to avoid further exceedance;
	frequency to daily;	Contractor on the potential	Contractor on the remedial	3. Submit proposals for
	4. Carry out analysis of the	remedial measures; and	measures to be	remedial measures to the ER
	Contractor's working procedures	4. Review and advise the ER	implemented;	with a copy to the IEC and
	with the ER to determine	and ET on the effectiveness	3. Supervise the	ET within three working days
	possible mitigation to be	of Contractor's remedial	implementation of remedial	of notification;
	implemented;	measures.	measures; and	4. Implement the agreed
	5. Arrange meeting with the IEC		4. If exceedance continues,	proposals;
	and ER to discuss the remedial		consider what portion of the	5. Revise and resubmit
	measures to be taken;		work is responsible and	proposals if problem still not
	6. Review the effectiveness of		instruct the Contractor to	under control; and
	the Contractor's remedial		stop that portion of work	6. Stop the relevant portion
	measures and keep IEC, EPD		until the exceedance is	of works as determined by
	and ER informed of the results;		abated.	the ER until the exceedance
	and			is abated.
	7. If exceedance stops, cease			
	additional monitoring.			

Noise

EVENT	ACTION								
EVENI	ET	IEC	ER	CONTRACTOR					
ACTION LEVEL	1. Notify the Contractor, IEC	Review the investigation	1. Confirm receipt of	Investigate the complaint					
	and ER;	results submitted by the	notification of complaint in	and propose remedial					
	2. Discuss with the ER and	Contractor; and	writing;	measures;					
	Contractor on the remedial	2. Review and advise the ET	2. Review and agree on the	2. Report the results of					
	measures required; and	and ER on the effectiveness	remedial measures proposed	investigation to the IEC, ET					
	3. Increase monitoring	of the remedial measures	by the Contractor; and	and ER;					
	frequency to check mitigation	proposed by the Contractor.	3. Supervise implementation	3. Submit noise mitigation					
	effectiveness.		of remedial measures.	proposals to the ER with					
				copy to the IEC and ET					
				within three working days of					
				notification; and					
				4. Implement noise mitigation					
				proposals.					
LIMIT LEVEL	1. Notify the Contractor, IEC,	Check monitoring data	1. Confirm receipt of	Identify source and					
	EPD and ER;	submitted by the ET;	notification of failure in	investigate the causes of					
	2. Repeat measurement to	2. Check the Contractor's	writing;	exceedance;					
	confirm findings;	working method;	2. In consultation with the ET	2. Take immediate action to					
	3. Increase monitoring	3. Discuss with the ER, ET	and IEC, agree with the	avoid further exceedance;					
	frequency;	and Contractor on the	Contractor on the remedial	3. Submit proposals for					
	4. Carry out analysis of	potential remedial measures;	measures to be	remedial measures to the ER					

Contractor's working	and	implemented;	with copy to the IEC and ET
procedures to determine	4. Review and advise the ET	3. Supervise the	within three working days of
possible mitigation to be	and ER on the effectiveness	implementation of remedial	notification;
implemented;	of the remedial measures	measures; and	4. Implement the agreed
5. Arrange meeting with the	proposed by the Contractor.	4. If exceedance continues,	proposals;
IEC and ER to discuss the		consider what portion of the	5. Revise and resubmit
remedial measures to be		work is responsible and	proposals if problem still not
taken;		instruct the Contractor to	under control; and
6. Review the effectiveness		stop that portion of work until	6. Stop the relevant portion
of Contractor's remedial		the exceedance is abated.	of works as determined by
measures and keep IEC,			the ER until the exceedance
EPD and ER informed of the			is abated.
results; and			
7. If exceedance stops,			
cease			

Water Quality

EVENT		ACTION							
		ET Leader		IEC		ER		CONTRACTOR	
Action level being exceeded	•	Repeat in situ	•	Discuss with ET and	•	Discuss with IEC on the	•	Inform the ER and	
by one sampling day		measurement to		Contractor on the		proposed mitigation		confirm notification of	
		confirm findings;		mitigation measures;		measures;		the non-compliance in	
	•	Identify reasons for	•	Review proposals on	•	Make agreement on the		writing;	
		non-compliance and		mitigation measures		mitigation measures to	•	Rectify unacceptable	
		source(s) of impact;		submitted by		be implemented.		practice;	
	•	Inform IEC and		Contractor and advise	•	Assess the	•	Check all plant and	
		Contractor;		the ER accordingly;		effectiveness of the		equipment;	
	•	Check monitoring data,	•	Assess the		implemented mitigation	•	Consider changes of	
		all plant, equipment		effectiveness of the		measures.		working methods;	
		and Contractor's		Implemented mitigation			•	Discuss with ET and	
		working methods;		measures.				IEC and propose	
	•	Discuss mitigation						mitigation measures to	
		measures with IEC and						IEC and ER;	
		Contractor;					•	Implement the agreed	
	•	Repeat measurement						mitigation measures.	
		on next day of							
		exceedance.							

		ET Leader		IEC		ER		CONTRACTOR
Action level being exceeded	•	Repeat in situ	•	Discuss with ET and	•	Discuss with IEC on the	•	Inform the ER and
by more than one		measurement to		Contractor on the		proposed mitigation		confirm notification of
consecutive sampling day		confirm findings;		mitigation measures;		measures;		the non-compliance in
	•	Identify reasons for	•	Review proposals on	•	Make agreement on the		writing;
		non-compliance and		mitigation measures		mitigation measures to	•	Rectify unacceptable
		source(s) of impact;		submitted by		be implemented;		practice;
	•	Inform IEC and		Contractor and advise	•	Assess the	•	Check all plant and
		Contractor;		the ER accordingly;		effectiveness of the		equipment;
	•	Check monitoring data,	•	Assess the		implemented mitigation	•	Consider changes of
		all plant, equipment		effectiveness of the		measures.		working methods;
		and Contractor's		implemented mitigation			•	Discuss with ET and
		working methods;		measures.				IEC and propose
	•	Discuss mitigation						mitigation measures to
		measures with IEC and						IEC and ER within
		Contractor;						three working days;
	•	Ensure mitigation					•	Implement the agreed
		measures are						mitigation measures.
		implemented;						
	•	Prepare to increase the						
		monitoring frequency to						
		daily;						

	Repeat measurement			
	on next day of			
	exceedance.			
	ET Leader	IEC	ER	CONTRACTOR
Limit level being	Repeat in situ	Discuss with ET and	Discuss with IEC, ET	Inform the ER and
exceeded by one	measurement to	Contractor on the	and Contractor on the	confirm notification of
sampling day	confirm findings;	mitigation measures;	proposed mitigation	the non-compliance in
	 Identify reasons for 	Review proposals on	measures;	writing;
	non-compliance and	mitigation measures	Request Contractor to	Rectify unacceptable
	source(s) of impact;	submitted by	critically review the	practice;
	Inform IEC Contractor	Contractor and advise	working methods;	Check all plant and
	and EPD;	the ER accordingly;	Make agreement on the	equipment;
	Check monitoring data,	Assess the	mitigation measures to	Consider changes of
	all plant, equipment	effectiveness of the	be implemented;	working methods;
	and Contractor's	implemented mitigation	Assess the	Discuss with ET, IEC
	working methods;	measures.	effectiveness of the	and ER and propose
	Discuss mitigation		implemented mitigation	mitigation measures to
	measures with IEC, ER		measures.	IEC and ER within
	and Contractor;			three working days;
	Ensure mitigation			Implement the agreed
	measures are			mitigation measures.
	implemented;			

	Increase the monitoring frequency to daily until no exceedance of Limit level.			
	ET Leader	IEC	ER	CONTRACTOR
Limit level being	Repeat in situ	Discuss with ET and	 Discuss with IEC, ET 	 Inform the ER and
exceeded by more	measurement to	Contractor on the	and Contractor on the	confirm notification of
than one	confirm findings;	mitigation measures;	proposed mitigation	the non-compliance in
consecutive	 Identify reasons for 	Review proposals on	measures;	writing;
sampling day	non-compliance and	mitigation measures	Request Contractor to	Rectify unacceptable
	source(s) of impact;	submitted by	critically review the	practice;
	Inform IEC Contractor	Contractor and advise	working methods;	Check all plant and
	and EPD;	the ER accordingly;	Make agreement on the	equipment;
	 Check monitoring data, 	Assess the	mitigation measures to	Consider changes of
	all plant, equipment	effectiveness of the	be implemented;	working methods;
	and Contractor's	implemented mitigation	Assess the	Discuss with ET, IEC
	working methods;	measures.	effectiveness of the	and ER and propose
	Discuss mitigation		implemented mitigation	mitigation measures to
	measures with IEC, ER		measures;	IEC and ER within
	and Contractor;		Consider and instruct, if	three working days;
	Ensure mitigation		necessary, the	Implement the agreed
	measures are		Contractor to slow	mitigation measures;

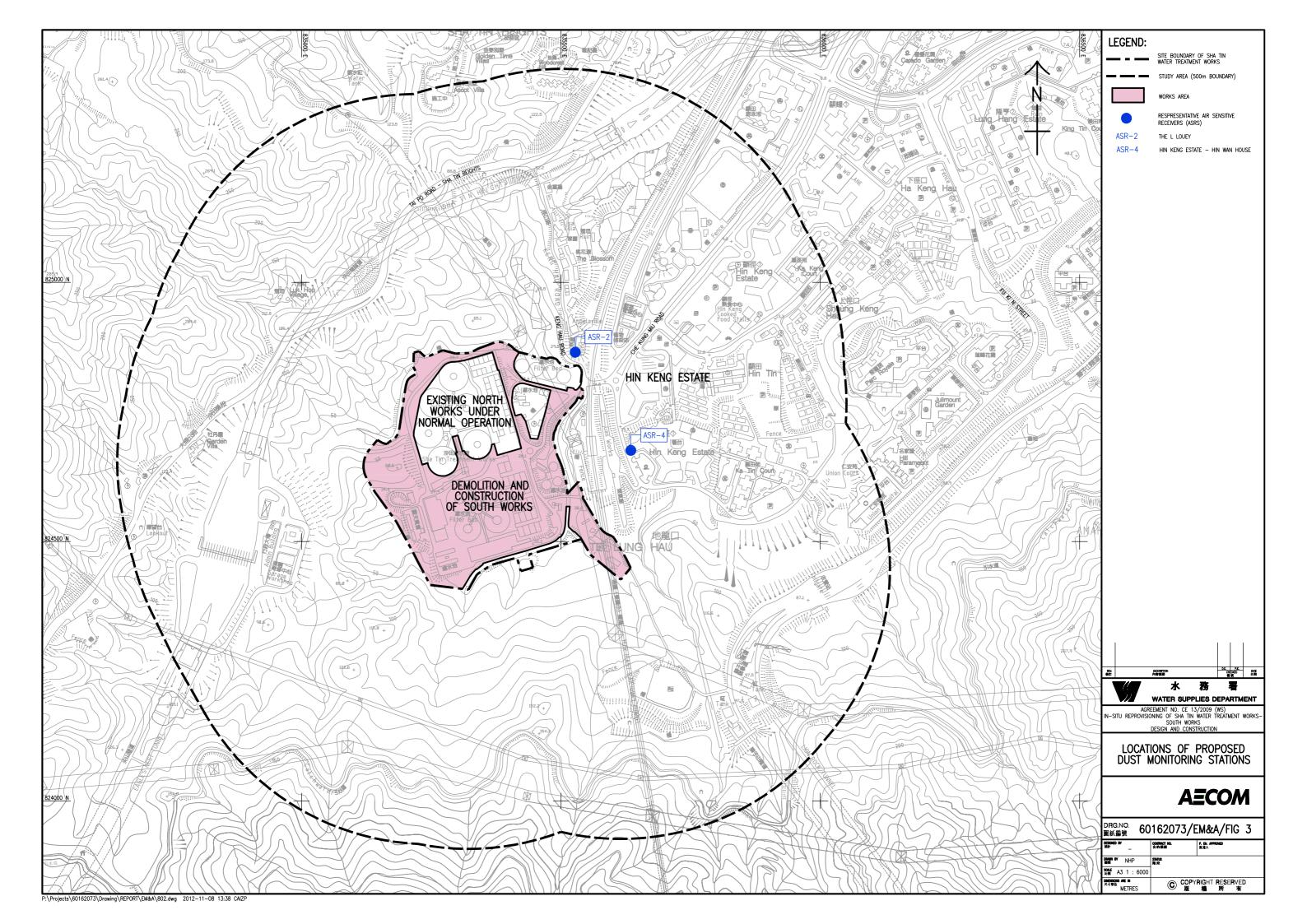
implemented; Increase	down or to stop all or	As directed by the ER,
the monitoring	part of the construction	to slow down or to stop
frequency to daily until	activities until no	all or part of the
no exceedance of Limit	exceedance of Limit	construction activities.
level for two	level.	
consecutive days.		

Appendix H Impact Monitoring Schedules

Impact Monitoring Schedule for STWTW

Impact Monitoring Schedule for STWTW							
Comp			Mar-17	Thur	lest	C-4	
Sun	Mon	Tue	Wed	1 nur	Fri	Sat 4	
			1	2	3	4	
			Impact		Impact		
			Water Quality monitoring for C1,		Water Quality monitoring for C1,		
			C2, C3, M1, M2 & M3		C2, C3, M1, M2 & M3		
			Air monitoring for AM1 & AM2				
			Noise monitoring for NM1, NM2				
			& NM3				
5	6	7	8	9	10	11	
	Impact		Impact		Impact		
	Water Quality monitoring for C1,		Water Quality monitoring for C1,		Water Quality monitoring for C1,		
	C2, C3, M1, M2 & M3		C2, C3, M1, M2 & M3		C2, C3, M1, M2 & M3		
	Air monitoring for AM1 & AM2				Air monitoring for AM1 & AM2		
	Noise monitoring for NM1, NM2				Noise monitoring for NM1, NM2		
	& NM3				& NM3		
12	13	14	15	16	17	18	
	Impact		Impact		Impact		
	past		P. 1. 2.1		p. 1 4 4		
	Water Quality monitoring for C1,		Water Quality monitoring for C1,		Water Quality monitoring for C1,		
	C2, C3, M1, M2 & M3		C2, C3, M1, M2 & M3		C2, C3, M1, M2 & M3		
			Air monitoring for AM1 & AM2				
			Noise monitoring for NM1, NM2				
			& NM3				
19	20	21	22	23	24	25	
	Impact		Impact		Impact		
	Water Quality monitoring for C1,		Water Quality monitoring for C1,		Water Quality monitoring for C1,		
	C2, C3, M1, M2 & M3		C2, C3, M1, M2 & M3		C2, C3, M1, M2 & M3		
	Air monitoring for AM1 & AM2				Air monitoring for AM1 & AM2		
	Noise monitoring for NM1, NM2				Noise monitoring for NM1, NM2		
	& NM3				& NM3		
26	27	28	29	30	31		
	Impact		Impact		Impact		
	Water Quality monitoring for C1,		Water Quality monitoring for C1,		Water Quality monitoring for C1,		
	C2, C3, M1, M2 & M3		C2, C3, M1, M2 & M3		C2, C3, M1, M2 & M3		
			Air monitoring for AM1 & AM2				
			Noise monitoring for NM1, NM2				
			& NM3				

Appendix I Location Plan of Air Quality Monitoring Station



Appendix J Calibration Certificates (Air Monitoring)



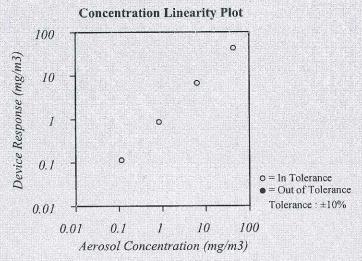
CERTIFICATE OF CALIBRATION AND TESTING

TSI Incorporated, 500 Cardigan Road, Shoreview, MN 55126 USA Tel: 1-800-874-2811 1-651-490-2811 Fax: 1-651-490-3824 http://www.tsi.com

Environment Conditions		
Temperature	73.92 (23.3)	°F (°C)
Relative Humidity	59.8	%RH
Barometric Pressure	28.73 (972.9)	inHg (hPa)

Model	8532
Serial Number	8532114409

⊠As Le	Ω		⊠ıı	Tolerance
△ AS LE	311			
☐ As Fo	d		Пс	ut of Tolerance
LIASTU	Junu			ME OF TOTOLINGO



System ID: DTII01-02

FLOW AND PRESSURE VERIFICATION							SYSTEM DTII01-02
Parameter		Measured	Allowable Range	Parameter	Standard	Measured	Allowable Range
Flow Ipm	3.1	3.0	2.97 ~ 3.29	Pressure kPa	97.3	97.3	92.44 ~ 102.17

TSI Incorporated does hereby certify that all materials, components, and workmanship used in the manufacture of this equipment are in strict accordance with the applicable specifications agreed upon by TSI and the customer and with all published specifications. All performance and acceptance tests required under this contract were successfully conducted according to required specifications. There is no NIST standard for optical mass measurements. Calibration of this instrument performed by TSI has been done using emery oil and has been nominally adjusted to respirable mass per standard ISO 12103-1, A1 test dust (Arizona dust) Our calibration ratio is greater than 1.2:1

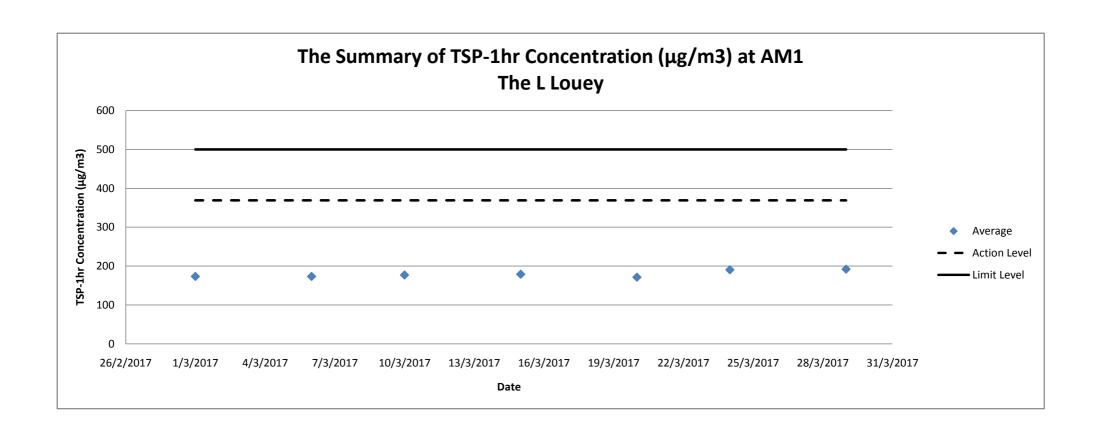
Measurement Variable	System ID	Last Cal.	Cal. Due	Measurement Variable	System ID	Last Cal.	Cal. Due
Temp/Humidity	E005656	03-08-16	03-08-17	Temp/Humidity	E005657	03-16-16	03-16-17
DC Voltage	E003314	05-19-16	05-19-17	DC Voltage	E003315	05-19-16	05-19-17
Photometer	E003319	01-22-16	07-22-16	Microbalance	M001324	01-05-15	01-05-17
1 um PSL	655458	n/a	n/a	3 um PSL	43042	n/a	n/a
10 um PSL	42808	n/a	n/a	Pressure	E003511	10-22-15	10-22-16
Flowmeter	E002471	04-26-16	04-26-17				

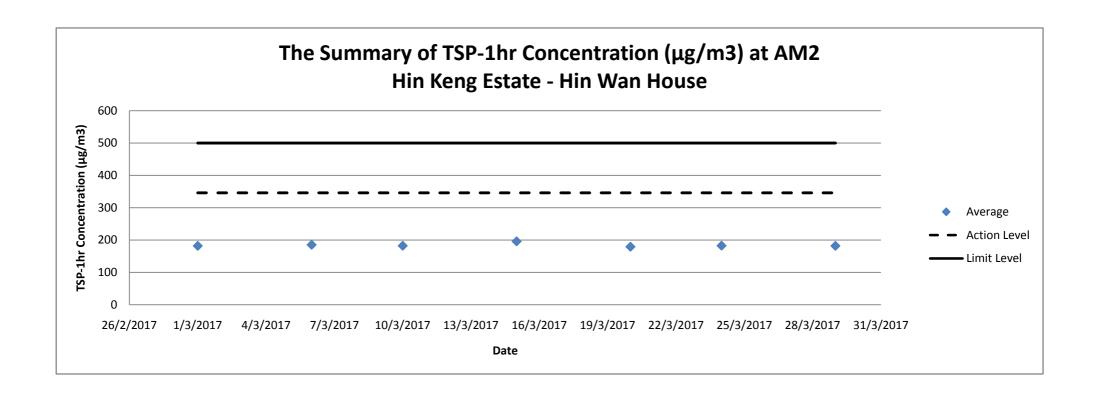
Sour Chang

June 15, 2016

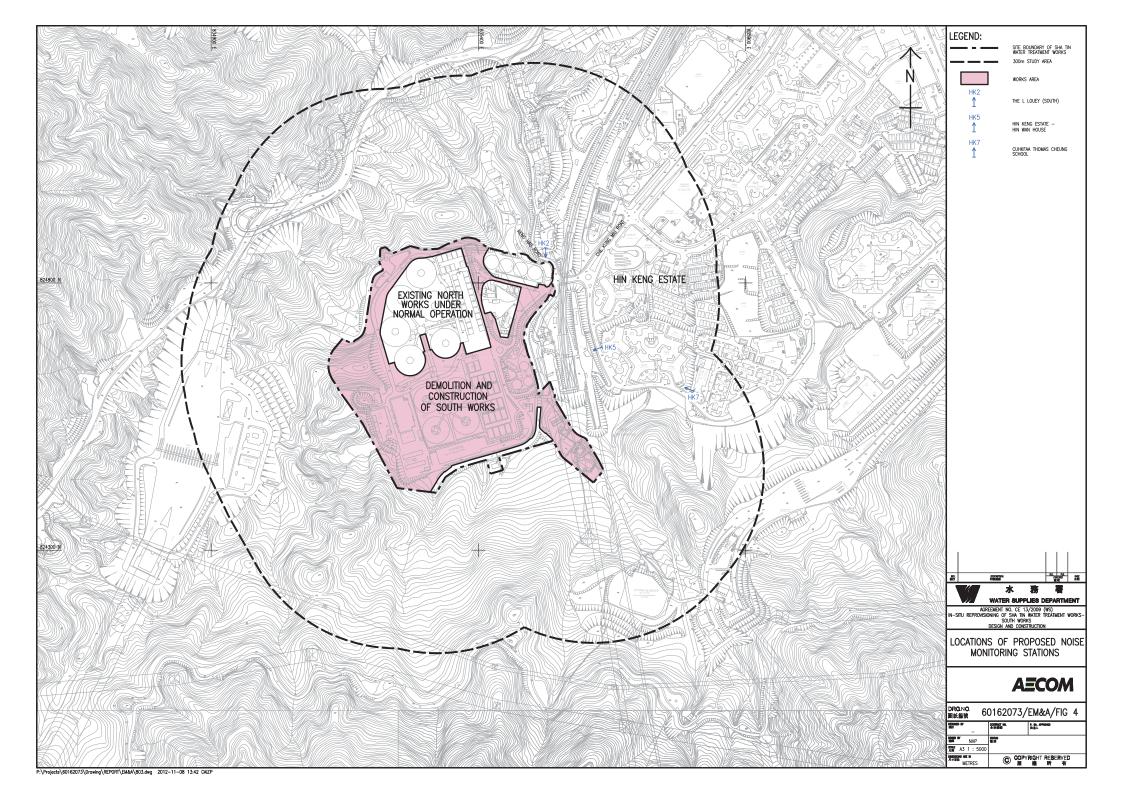
Date

Appendix K Impact Air Quality Monitoring Results and Graphical Presentation





Appendix L Location Plan of Noise Monitoring Station



Appendix M Calibration Certificates (Noise)



輝創工程有限公司

Sun Creation Engineering Limited

Calibration and Testing Laboratory

Certificate of Calibration

校正證書

Certificate No.:

C166584

證書編號

Date of Receipt / 收件日期: 15 November 2016

ITEM TESTED / 送檢項目 (Job No. / 序引編號: IC16-2614)

Description / 儀器名稱

Sound Level Meter

Manufacturer / 製造商 Model No. / 型號

Pulsar

Serial No. / 編號

43

PN1374

Supplied By / 委託者

Acumen Environmental Engineering and Technologies Co., Ltd.

Lot 11, Tam Kon Shan Road, North Tsing Yi, N.T.

TEST CONDITIONS/測試條件

Temperature / 溫度 :

 $(23 \pm 2)^{\circ}$ C

Relative Humidity / 相對濕度 :

 $(55 \pm 20)\%$

Line Voltage / 電壓

TEST SPECIFICATIONS / 測試規範

Calibration check

DATE OF TEST / 測試日期

25 November 2016

TEST RESULTS / 測試結果

The results apply to the particular unit-under-test only.

The results do not exceed manufacturer's specification.

The results are detailed in the subsequent page(s).

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

- The Government of The Hong Kong Special Administrative Region Standard & Calibration Laboratory
- Agilent Technologies / Keysight Technologies
- Rohde & Schwarz Laboratory, Germany
- Fluke Everett Service Center, USA

Tested By

測試

HT Wong Technical Officer

Certified By

核證

K C Lee

Date of Issue

25 November 2016

簽發日期 Project Engineer

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

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



輝創工程有限公司

Sun Creation Engineering Limited

Calibration and Testing Laboratory

Certificate of Calibration

Certificate No.: C166584

證書編號

校正證書

- 1. The unit-under-test (UUT) was allowed to stabilize in the laboratory for over 12 hours, and switched on to warm up for over 10 minutes before the commencement of the test.
- 2. Self-calibration using laboratory acoustic calibrator was performed before test from 6.1.1.2 to 6.3.2.
- 3. The results presented are the mean of 3 measurements at each calibration point.
- 4. Test equipment:

Equipment ID

Description

Certificate No.

CL280 CL281 40 MHz Arbitrary Waveform Generator

C160077

Multifunction Acoustic Calibrator

PA160023

- 5. Test procedure: MA101N.
- 6. Results:
- 6.1 Sound Pressure Level
- 6.1.1 Reference Sound Pressure Level

6.1.1.1 Before Self-calibration

UUT Setting		Applied	UUT	
Frequency Weighting	Time Weighting	Level (dB)	Freq. (kHz)	Reading (dB)
LA	F	94.00	1	93.9

6.1.1.2 After Self-calibration

UUT	Setting	Applied Value		UUT	IEC 61672 Class 1
Frequency	Time	Level	Freq.	Reading	Spec.
Weighting	Weighting	(dB)	(kHz)	(dB)	(dB)
LA	F	94.00	1	93.7	± 1.1

6.1.2 Linearity

UUT	Setting	Applied Value		UUT
Frequency Weighting	Time Weighting	Level (dB)	Freq. (kHz)	Reading (dB)
LA	F	94.00	1	93.7 (Ref.)
		104.00		103.7
		114.00		113.7

IEC 61672 Class 1 Spec. : \pm 0.6 dB per 10 dB step and \pm 1.1 dB for overall different.

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

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Sun Creation Engineering Limited

Calibration and Testing Laboratory

Certificate of Calibration

校正證書

Certificate No.:

C166584

證書編號

6.2 Time Weighting

UUT	UUT Setting Applied		d Value	UUT	IEC 61672 Class 1
Frequency Weighting	Time Weighting	Level (dB)	Freq. (kHz)	Reading (dB)	Spec. (dB)
LA	F	94.00	1	93.7	Ref.
	S			93.7	± 0.3

6.3 Frequency Weighting

6.3.1 A-Weighting

UUT Setting		Appli	ed Value	UUT	IEC 61672 Class 1
Frequency Weighting	Time Weighting	Level (dB)	Freq.	Reading (dB)	Spec. (dB)
LA	F	94.00	63 Hz	67.5	-26.2 ± 1.5
			125 Hz	77.5	-16.1 ± 1.5
			250 Hz	85.0	-8.6 ± 1.4
			500 Hz	90.4	-3.2 ± 1.4
			1 kHz	93.7	Ref.
			2 kHz	94.9	$+1.2 \pm 1.6$
			4 kHz	94.7	$+1.0 \pm 1.6$
			8 kHz	92.9	-1.1 (+2.1; -3.1)
			12.5 kHz	89.4	-4.3 (+3.0; -6.0)

6.3.2 C-Weighting

UUT Setting		Applied Value		UUT	IEC 61672 Class 1
Frequency	Time	Level	Freq.	Reading	Spec.
Weighting	Weighting	(dB)		(dB)	(dB)
LC	F	94.00	63 Hz	92.9	-0.8 ± 1.5
			125 Hz	93.5	-0.2 ± 1.5
			250 Hz	93.7	0.0 ± 1.4
			500 Hz	93.7	0.0 ± 1.4
			1 kHz	93.7	Ref.
			2 kHz	93.5	-0.2 ± 1.6
			4 kHz	93.0	-0.8 ± 1.6
			8 kHz	91.0	-3.0 (+2.1; -3.1)
			12.5 kHz	87.5	-6.2 (+3.0 ; -6.0)

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輝創工程有限公司

Sun Creation Engineering Limited

Calibration and Testing Laboratory

Certificate of Calibration 校正證書

Certificate No.:

C166584

證書編號

Remarks: - UUT Microphone Model No.: PM1 & S/N: 011060C

- Mfr's Spec. : IEC 61672 Class 1

- Uncertainties of Applied Value: 94 dB: 63 Hz - 125 Hz $: \pm 0.35 \text{ dB}$

250 Hz - 500 Hz $: \pm 0.30 \text{ dB}$ 1 kHz $: \pm 0.20 \text{ dB}$ 2 kHz - 4 kHz $: \pm 0.35 \text{ dB}$ 8 kHz $: \pm 0.45 \text{ dB}$ 12.5 kHz $: \pm 0.70 \text{ dB}$

104 dB : 1 kHz $: \pm 0.10 \text{ dB (Ref. 94 dB)}$ 114 dB : 1 kHz $: \pm 0.10 \text{ dB (Ref. 94 dB)}$

- The uncertainties are for a confidence probability of not less than 95 %.

Note:

Only the original copy or the laboratory's certified true copy is valid.

The values given in this Certificate only relate to the values measured at the time of the test and any uncertainties quoted will not include allowance for the equipment long term drift, variations with environment changes, vibration and shock during transportation, overloading, mis-handling, or the capability of any other laboratory to repeat the measurement. Sun Creation Engineering Limited shall not be liable for any loss or damage resulting from the use of the equipment.

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

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香港特別行政區政府標準及校正實驗所

Certificate of Calibration

校正證書

Certificate No. PA160049

證書編號

Page 1 of 6 pages

(共

Customer / 客戶 Acumen Environmental Engineering & Technologies Co. Ltd.

Lot 11, Tam Kon Shan Road,

Tsing Yi (N), Hong Kong

Equipment / 儀器

Description / 名稱

Sound Calibrator

Make/製造商

Pulsar

Model / 型號

105

Serial No. / 序號

70396

Date of Receipt / 收件日期

25 April 2016

Test Environment / 測試環境

Temperature / 溫度

 $(23 \pm 1) \, ^{\circ}C$

Relative Humidity / 相對濕度

 $(45 \pm 8) \%$

Air Pressure / 氣壓

(99.3 to 99.4) kPa

Date of Test / 測試日期

26 April 2016

Test Specifications / 測試規格

Calibrate the sound pressure level, frequency and total distortion of the acoustical calibrator at 94 dB in accordance with the International Standard IEC 60942: 2003 Annex B.

Test Results / 測試結果

The results are detailed in the continuation pages.

Approved Signatory

Lam Hoi Shan

Date: 27 April 2016

Hong Kong Accreditation Service (HKAS) has accredited this laboratory (Reg. No. HOKLAS 051) under the Hong Kong Laboratory Accreditation Scheme (HOKLAS) for specific calibration activities as listed in the HOKLAS directory of accredited laboratories. The results shown in this certificate are metrologically

traceable to the International System of Units (S.I.) or recognised measurement standards. 香港認可處已根據香港實驗所認可計劃,認可本實驗所 (Reg. No. HOKLAS 051)進行 (認可實驗所所名冊) 內載列的指定活動。本證書所載結果可溯源至國際單位制或公認

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Main Laboratory : 36/F, Immigration Tower, 7 Gloucester Road, Wan Chai, Hong Kong.

Branch Laboratory: G04, Public Works Central Laboratory Building, 2B Cheung Yip Street, Kowloon Bay, Kowloon.

總所:香港灣仔告土打道7號入境事務大樓36樓 分所: 九龍九龍灣祥業街 2 號 B 工務中央試驗所大樓地下 04 室 雷話: 2829 4830 電話: 2798 7347 Tel: 2829 4830 Tel: 2798 7347

M010248



香港特別行政區政府標準及校正實驗所

Certificate of Calibration (Continuation Page) 校正證書 (續頁)

Certificate No. PA160049

 Page
 2
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 6
 pages

 第
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證書編號

- 1. The test equipment was allowed to stabilise in the laboratory environment at 23 °C and 45 % RH for over 24 hours before the test.
- 2. The power supply to the instrument under test was one 9 V battery.
- 3. Procedures from IEC 60942: 2003 Annex B were used to perform the calibration, which included the following tests:
 - (1) Sound pressure level

Performance tests were carried out in accordance with Section B.3.4 of IEC 60942: 2003. The sound pressure level generated by the Pulsar 105 was measured by a laboratory B & K 4180 standard microphone. Measurement results are presented in Table 1.

(2) Frequency

Relevant tests were carried out in accordance with Section B.3.5 of IEC 60942: 2003. The frequency of the acoustic signal was measured by a frequency counter. Measurement results are presented in Table 2.

(3) Total distortion

Relevant tests were carried out in accordance with Section B.3.6 of IEC 60942: 2003. The distortion of the acoustic signal was measured by a distortion meter. Measurement results are presented in Table 3.

4. No adjustment was made to the instrument under test.

Calibrated by:

Y.C. Kwan

Checked by:

H S I am

Date: 26 April 2016



香港特別行政區政府標準及校正實驗所

Certificate of Calibration (Continuation Page) 校正證書 (續頁)

Certificate No. PA160049 證書編號

Page 3 of 6 pages 第 頁 (共 頁)

- The Sound Calibrator has been shown to conform to the class 1 requirements 5. for periodic testing, described in Annex B of IEC 60942: 2003 for the sound pressure level, frequency and total distortion stated, for the environmental conditions under which the tests were performed. However, as public evidence was not available, from a testing organization responsible for pattern approval, to demonstrate that the model of sound calibrator conformed to the requirements for pattern evaluation described in Annex A of IEC 60942: 2003, no general statement or conclusion can be made about conformance of the sound calibrator to the requirements IEC 60942: 2003.
- 6. The measurement uncertainty evaluation has been carried out in accordance with principles in the Evaluation of Measurement Data Guide to the Expression of Uncertainty in Measurement, JCGM 100:2008. The expanded measurement uncertainty U, with its coverage factor k, corresponds to a 95 % probability that the value of the measurand Y lies within the interval y-U to y+U. The combined standard measurement uncertainty u_c can be calculated as $u_c = U/k$ and its degrees of freedom v_{eff} is given by the t-distribution with the respective k value.
- 7. The values given in this Certificate of Calibration only relate to the values measured at the time of the test and any measurement uncertainties quoted will not include allowances for the equipment long term drift, variations with environmental changes, vibration and shock during transportation, or the capability of any other laboratory to repeat the measurement.
- 8. This certificate is consistent with the capabilities that are included in Appendix C of the MRA drawn up by the CIPM. Under the MRA, all participating institutes recognise the validity of each other's calibration and measurement certificates for the quantities, ranges and measurement uncertainties specified in Appendix C (for details see http://www.bipm.org).

CIPM

International Committee for Weights and Measures

MRA

Mutual Recognition Arrangement

Calibrated by:

Y.C. Kwan

Checked by:

H.S. Lam

Date: 26 April 2016



香港特別行政區政府標準及校正實驗所

Certificate of Calibration (Continuation Page) 校正證書(續頁)

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Table 1 Sound Pressure Level Test Results

	Measured Sound Pressure Level ⁽¹⁾										
Pulsar 105 Sound Pressure Level Setting	Value y	Measurement Expanded Measurement Uncertainty U	Uncertainty Coverage Factor k								
94 dB	93.94 dB	0.06 dB	2.0								

Note (1): Measurement results at measurement conditions were corrected to the following reference conditions:

Temperature: 23 °C

Humidity:

50 % RH

Pressure:

101.325 kPa

Calibrated by:

Checked by:

Date: 26 April 2016



香港特別行政區政府標準及校正實驗所

Certificate of Calibration (Continuation Page)

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<u>Table 2</u> Frequency Test Results⁽¹⁾

	Measured Frequency										
Pulsar 105		Measurement Uncertainty									
Sound Pressure Level Setting	Value y	Expanded Measurement Uncertainty U	Coverage Factor								
94 dB	1 000.275 Hz	0.010 Hz	2.0								

Note (1): Items not supported by CIPM MRA.

Calibrated by:

Y.C. Kwan

Checked by:

H.S. Lam

Date: 26 April 2016



香港特別行政區政府標準及校正實驗所

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<u>Table 3</u>

<u>Total Distortion Test Results⁽¹⁾</u>

	Measured Total Distortion									
Pulsar 105		Measurement Uncertainty								
Sound Pressure Level Setting	Value y	Expanded Measurement Uncertainty U	Coverage Factor							
94 dB	0.2 %	0.5 %	2.0							

Note (1): Items not supported by CIPM MRA.

- END -

Calibrated by:

Y.C. Kwan

Checked by:

H.S. Lam

Date: 26 April 2016





This instrument was produced under rigorous factory production control and documented standard procedures. It was individually visually inspected, leak tested and function tested for display, backlight, button and software performance. The accuracy of each of its primary measurements was individually calibrated and/or tested against standards traceable to the National Institute of Standards and Technology ("NIST") or calibrated intermediary standards. This instrument is certified to have performed at the time of manufacture in compliance with the following specifications as they apply to this meter's specific model, measurements and features.

Methods Used in Calibration and Testing

Wind Speed:

The Kestrel Pocket Weather Meter impeller installed in this unit was individually tested in a subsonic wind tunnel operating at approximately 300 fpm (1.5 m/s) and 1200 fpm (6.1 m/s) monitored by a Gill Instruments Model 1350 ultrasonic time-of-flight anemometer. The Standard's maximum combined uncertainty is +/-1.04% within the airspeed range 706.6 to 3923.9 fpm (3.59 to 19.93 m/s), and +/-1.66% within the airspeed range 166.6 to 706.6 fpm (0.85 to 3.59 m/s).

Temperature:

Temperature response is verified in comparison with a Eutechnics 4600 Precision Thermometer or a standard Kestrel 4000 Weather and Environmental Meter calibrated weekly against the Eutechnics 4600. The Eutechnics 4600 is calibrated annually and is traceable to NIST with a system accuracy of +/- 0.05 °C.

Direction / Heading

The sensitivity of the magnetic directional sensor is verfied at the component level by applying a magnetic field to the sensor and measuring the signal output at 4 points, as well as after assembly by orienting the unit to the cardinal directions and measuring the magnetic field output. In both cases the compass output must be accurate to within +/- 5 degrees.

Relative Humidity:

Relative humidity receives a two-point calibration in humidity and temperature controlled chambers at 75.3% RH and 32.8% RH at 25° C. The calibration tanks are monitored with an Edgetech Model 2002 DewPrime II Standard Chilled Mirror Hygrometer. Following calibration, performance is further verified at an RH of approximately 43.2% against the Edgetech Hygrometer. The Edgetech Hygrometer is calibrated annually and is traceable to NIST with a maximum relative expanded uncertainty of +/- 0.2% RH.

Barometric Pressure:

Pressure response is verified against a Mensor Series 6000 Digital Barometer or a standard Kestrel 4000 Weather and Environmental Meter calibrated weekly against the Mensor Barometer. The Mensor Barometer is calibrated annually and is traceable to NIST with a maximum relative expanded uncertainty of +/- 0.02% F.S.

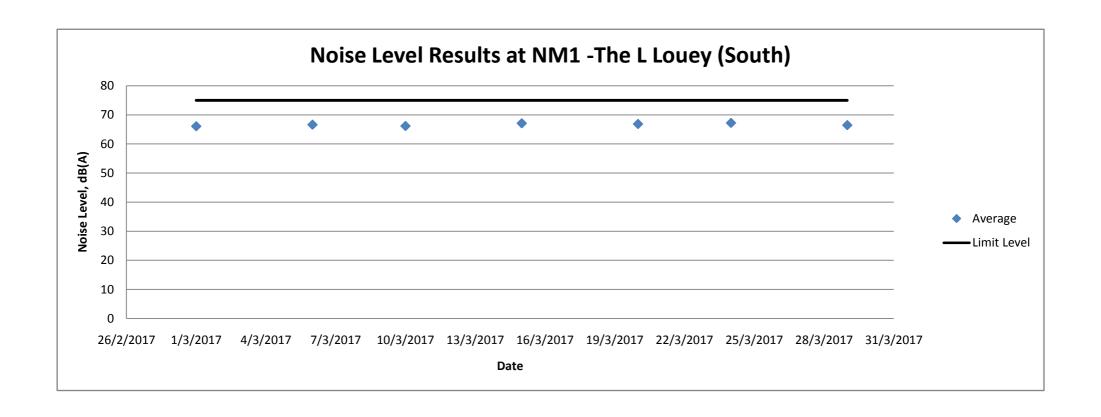
Approved By:

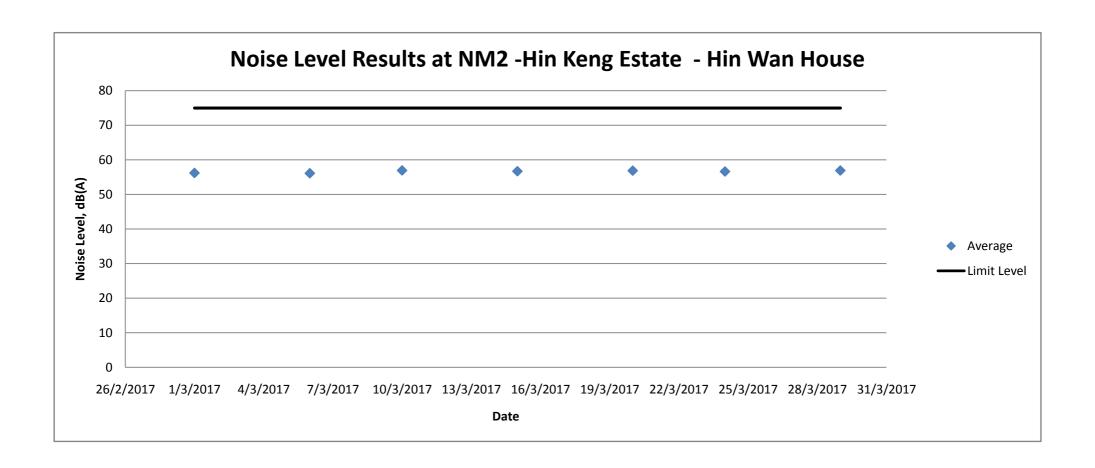
Michael Naughton, Engineering Manager

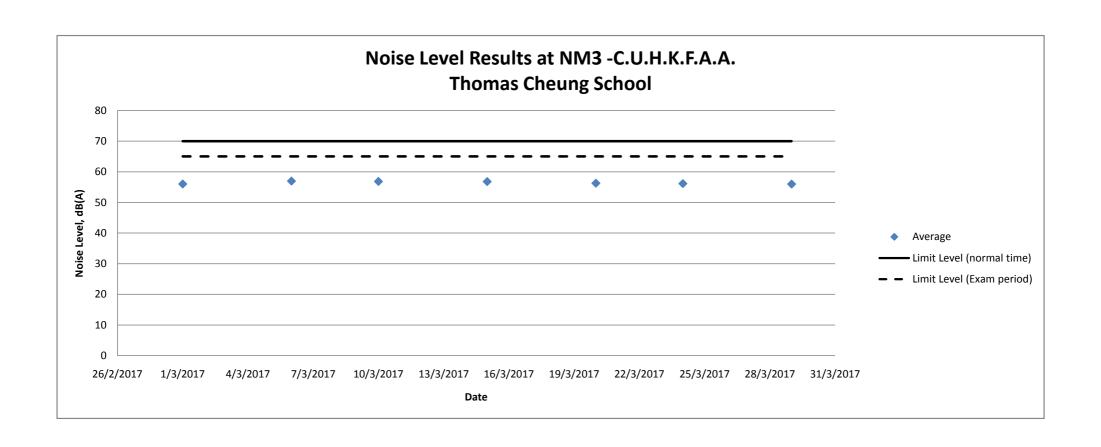
SENSOR	1000	2000	2500	3000	3500	3500	4000	4200	4250	4300	4400	4500	4500	ACCURACY (+/-)*	SENSO	SPECIFICATION RANGE	OPERATIONAL RANGE	NOTES
Wind Speed Air Flow	•	•	•	•	•	•	•	•	•	٠	•	•	HOR	Larger of 3% of reading, least significant digit or 20 ft/min	0.1 m/s 1 ft/min 0.1 km/h 0.1 mph 0.1 knots 1 B	0.6 to 40.0 m/s 118 to 7,874 ft/min 2.2 to 144.0 km/h 1.3 to 89.5 mph 1.2 to 77.8 knots 0 to 12 B	0.6 to 60.0 m/s 118 to 11,811 ft/min 2.2 to 216.0 km/h 1.3 to 134.2 mph 1.2 to 116.6 km/ts 0 to 12.8	Inch/25 mm diameter impeller with precision axis and low-friction Zystell bearings. Startup is stated as lower limit, readings may be taken down to 0.4 mis [78 ftmm] [1.5 kmh] [9 mph], after impeller startup, Off-asis accuracy -1% @ 5° off-axis; 2% @ 10° -35% @ 15° -Cabrid off-arity -15% @ 10° -35% @ 15° -Cabrid off-arity -15% et al. (1.5 kmh) off-axis; 25% @ 10° -35% @ 15° -Cabrid off-arity -15% et al. (1.5 kmh) off-axis; 25% @ 10° -35% @ 15° -Cabrid off-axis; 25% @ 10° -35% @ 15° -Cabrid off-axis; 25% @ 10° -3
Ambient Temperature					٠	•					•		•	0.9*F 0.5*C	0.1 *F 0.1 *C	-20.0 to 158.0 °F -29.0 to 70.0 °C	14.0.0 to 131.0 'F -10.0 to 55.0 °C	Hermitically-sealed, practision thermition mounted externally and thermally isolated. US Pails 5,536,645 for rapid response, Aufflow of 2.2 mpc/1 mis or greater provides fastest response fastest reproduce fastest reproduced to the provided of the provide
Globe Temperature - Tg											•			*F 1.4 *C	0.1 °F 0.1 °C	-20.0 to 140.0 °F -29.0 to 60.0 °C	14.0 to 131.0 °F -10.0 to 55.0 °C	Temperature inside 1in 25 mm black powder coated copper globe converted to Tg equivalen standard 6 in 150 mm globe. Closest equivalence obtained with airflow greater than 2.2 mph m/s.
Relative Humidity											•			3.0 %RH	0.1 %RH	5 to 95% non-condensing	0 to 100%	Polymer capacitive humidity sensor mounted in thin-walled chamber external to case for rap accurate response (US Patent 6,257,074). To achieve stated accuracy, unit must be permit qualibate to external temperature when exposed to large, rapid temperature changes and out of direct suright. Calibration drift +7-2% over 24 months. Htm.Pdf sensor may be recall at factory or in fedular days fester thinding. Calibration first. Htm.Pdf D002.
Pressure			٠	23.5			•		٠				•	inHg 1.0 hPalmbar 0.01 PSI	0.01 inHg 0.1 hPa mbar 0.01 PSI	8.86 to 32.49 inHg 300.0 to 1100.0 hPajmbar 4.35 to 15.95 PSI and 32.0 to 185.0 °F 0.0 to 85.0 °C	0.30 to 48.87 inHg 10.0 to 1654.7 hPalmbar 0.14 to 24.00 PSI and 14.0 to 131.0 "F -10.0 to 55.0 "C	Monofilhis silicon piezoresistive pressure sensor with second-order temperature correction. Pressure sensor may be reclaimbed at factory in field. Adjustate SMS. Kestelet 4200 displays assistion pressure or transmittip pressure connected SMS. Kestelet 4200 displays station pressure or a dedicated screen. Relatelet 2500 and 3500 displays station pressure or an edicated screen. Relatelet 2500 and 3500 displays continuously update three-hour laterantine pressure the relationation management specifies and screen scree
Compass												•		5*	1* 1/16th Cardinal Scale	0 to 360°	0 to 360°	2-axis solid-state magnetoresistive sensor mounted perpendicular to unit plane. Accuracy of sensor dependent upon unifs vertical position. Self-calibration routine eliminates magnetic el from batteries or unit and must be run after verey full power-down (battery removal or chair. Readout indicates direction to which the back of the unit is pointed when held in a vertical orientation. Declaration brown size in deglarable for Tixe North readout.
														CALCUL	ATED ME	ASUREMENTS		
MEASUREMENT	1000	2000	2500	3000	3500	3500 DT	4000	4200	4250	4300	4400	4500	4500 HOR	ACCURACY (+/-)*	RESOLUTION	SPECIFICATION RANGE	SENSORS EMPLOYED	NOTES
Air Density	i jen	191		W	133	17	194	•	•		43	3	3,51	0.0002 lb/ft ³ 0.0033 kg/m ³	0.001 lbs/ft ³ 0.001 kg/m ³	Refer to Ranges for Sensors Employed	Temperature Relative Humidity Pressure	Mass of air per unit volume
Air Flow								•	-					6.71%	1 cfm 1 m²/hr 1 m²/m 0.1m²/s 1 L/s	Refer to Ranges for Sensors Employed	Air Flow User Input (Duct Shape & Size)	Volume of air flowing through an opening. Automatically calculated from Air Velocity measure and user-specified duct shape (circle or rectangle) and dimensions (units: in, ft, cm or m). Maximum duct dimension input: 258.0 in 21.5 ft 955.3 cm 6.55 m.
Altitude														typical: 23.6 ft 7.2 m max: 48.2 ft	1 ft 1 m	typical: 750 to 1100 mBar max: 300 to 750 mBar	Pressure User Input (Reference Pressure)	Height above Mean Sea Level ("MSL"). Temperature compensated pressure (barometric) altimeter requires accurate reference barometric pressure to produce maximum absolute accuracy. Both accuracy specs corresponds to a reference pressure anywhere from 850 to mBar.
Barometric Pressure					•	٠	٠							14.7 m 0.07 inHg 2.4 hPa mbar 0.03 PSI	0.01 inHg 0.1 hPa mbar 0.01 PSI	Refer to Ranges for Sensors Employed	Pressure User Input (Reference Altitude)	Air pressure that would be present in identical conditions at MSL. Station pressure compens for local elevation provided by reference altitude. Requires accurate reference altitude to proximum absolute accuracy.
Crosswind & Headwind/Tailwind														7.1%	1 mph 1 ft/min 0.1 km/h 0.1 m/s 0.1 knots	Refer to Ranges for Sensors Employed	Wind Speed Compass	Effective wind relative to a target or travel direction. Auto-switching headwindfallwind indical
Delta T														3.2 °F 1.8 °C	0.1 °F 0.1 °C	Refer to Ranges for Sensors Employed	Temperature Relative Humidity	Difference between dry bulb temperature and wet bulb temperature. When spraying, indicat evaporation rate and droplet lifetime. Safe range for pesticide spraying is 4 to 16 °F / 2 to 9
Density Altitude	JA L				1000									226 ft	1 ft	Refer to Ranges for	Pressure Temperature Relative Humidity	Local air density converted to equivalent elevation above sea level in a uniform layer consis
Denaity Autitude						101								69 m	1 m	Sensors Employed 15 to 95 % RH	Pressure	the International Standard Atmosphere. Temperature that a volume of air must be cooled to at constant pressure for the water vaporate to the cooled to a constant pressure for the water vaporate to the cooled to a constant pressure for the water vaporate to the cooled to a constant pressure for the water vaporate to the cooled to a constant pressure for the water vaporate to the cooled to a constant pressure for the water vaporate to the cooled to a constant pressure for the water vaporate to the cooled to a constant pressure for the water vaporate to the cooled to a constant pressure for the water vaporate to the cooled to a constant pressure for the water vaporate to the cooled to a constant pressure for the water vaporate to the cooled to a constant pressure for the water vaporate to the cooled to a constant pressure for the water vaporate to the cooled to a constant pressure for the water vaporate to the cooled to a constant pressure for the water vaporate to the cooled to a constant pressure for the water vaporate to the cooled to a constant pressure for the water vaporate to the cooled to a constant pressure for the water vaporate to the cooled to a constant pressure for the water vaporate to the cooled to a constant pressure for the cooled to a constant press
Dewpoint				•	•	•	•		•	•	•	•	•	1.9 °C	0.1 °C	Refer to Range for Temperature Sensor	Temperature Relative Humidity	present to condense into dewand form on a solid surface. Can also be considered to be the water-to-air saturation temperature.
Evaporation Rate														0.01 lib/ft²/hr 0.06 kg/m2/hr	0.01 b/ft²/hr 0.01 kg/m²/hr	Refer to Ranges for Sensors Employed	Wind Speed Temperature Relative Humidity Pressure User Input (Concrete Temperature)	The rate at which moisture is lost from the surface of curing concrete. Requires user measurement and entry of concrete temperature obtained with an accurate IR or grobe thermoreter (F or TC, not include). Readings should be taken 20 inches above pour surface with the thermistor shaded, and averaged for 6-10 seconds using built-in averaging function.
Heat Index	7.1	10	•	•	٠	23.54	٠	•	•	•	•	٠		7.1 °F 4.0 °C	0.1 °F 0.1 °C	Refer to Ranges for Sensors Employed	Temperature Relative Humidity	Perceived temperature resulting from the combined effect of temperature and relative humic Calculated based on NWS Heat Index (HI) tables. Measurement range limited by extent of published tables.
Moisture Content Humidity Ratio ("Grains")									•					.3 gpp .04 g/kg	0.1 gpp 0.01 g/kg	Refer to Ranges for Sensors Employed	Temperature Relative Humidity Pressure	Mass of water vapor in a mass of air.
Relative Air Density					247	177	1			100				0.3%	0.1%	Refer to Ranges for Sensors Employed	Temperature Relative Humidity	The ratio, expressed as a percentage, of measured air density to the air density of a standa atmosphere as defined by the ICAO.
hermal Work Limit (TWL)						La P	13.	100	1 98		•			10.9 W/m²	0.1 W/m²	Refer to Ranges for Sensors Employed	Pressure Wind Speed Temperature Globe Temperature Relative Humidity Pressure	armospere as connect or excession of the Control of the Control of the Conditions and coloring factors. Based off of estimated metabolic cutput of typical human. O screen zone varings.
Outdoor Wet Bulb Globe Temperature (WBGT)								198	1,11					1.3 °F 0.7 °C	0.1 °F 0.1 °C	Refer to Ranges for Sensors Employed	Wind Speed Temperature Globe Temperature Relative Humidity	Measure of human heat stress defined as the combination of effects due to radiation, convi and conduction. Outdoor WBGT is calculated from a veighted sum of natural web bull. Or the globe temperature (Tg), and dry bulb temperature (Td). User setable on-screen varning zo
Wet Bulb Temperature - aturally Aspirated (Tnwb)			1812			TERMINAL PROPERTY.	re-	a is	3 19	eşin Dşiril	•	10 145	201	1.4 °F 0.8 °C	0.1 *F 0.1 *C	Refer to Ranges for Sensors Employed	Pressure Wind Speed Temperature Globe Temperature Relative Humidity	Similar to psychrometric wer-bubl temperature (see below). However, Trivib only undergoes convection from the arrisent air velocity. Trivib is a measure of the evaporative cooling that will allow. This is accounted for by combring the effects of, mainly, relative humidity and windspeed.
Wet Bulb Temperature - Psychrometric		7.00	S 140	18.20										3.2 °F 1.8 °C	0.1 °F 0.1 °C	Refer to Ranges for Sensors Employed	Pressure Temperature Relative Humidity	Temperature indicated by a sling psychrometer. Due to nature of the psychrometric ratio for water-air system, this approximates the thermodynamic web-bulb temperature. The thermody web-bulb temperature is the temperature approach of air would have if cooled adiabatically to
Wind Chill	LW.	•	•						·					1.6 °F 0.9 °C	0.1 °F 0.1 °C	Refer to Ranges for Sensors Employed	Pressure Wind Speed Temperature	saturation temperature via water evaporating into it. Perceived temperature resulting from combined effect of wind speed and temperature. Calcibased on the NWS Wind Chill Temperature (WCT) Index, revised 2001, with wind speed all by a factor of 1.5 to wide devalvant results to wind speed measured at 10 m above cround.
C. 1 of 5U.			O.Y	(A)	133	901	1653	2423	MA			90		RESERVATION OF	The least			Measurement range limited by extent of published tables.
													2006	Reflective 3 1/2 digit LC	D. Digit height 0:38 in	CIFICATIONS 19 mm. Aviation green electro	luminescent backlight. Manual activation	on with auto-off.
Display & Backlight			•			•	•					•		Multifunction, multi-digit	monochrome dot-matri	x display. Choice of aviation	green or visible red (NV models only) of	uminescent backlight. Manual activation with auto-off. electroluminescent backlight. Automatic or manual activation.
Response Time & Display Update		•	•				•	•	٠	•	•	•	•	equilibrate to a large cha	ange in the measureme	event environment. Display update ant environment. Display update t and Average Wind measure	tes every 1 second.	nd all measurements which include RH in their calculation may require as long as 1 minute to f
Max/Avg Wind							•	•			•							with all other wind-related functions: air velocity, crosswind, headwind/tailwind, wind chill, WBC
ata Storage & Graphical Display, Min/Max/Avg History									3200 points					Minimum, maximum, ave	erage and logged histo re interval settable from	ry stored and displayed for ew n 2 seconds to 12 hours, oven	ery measured value. Large capacity di write on or off. Logs even when displa	ata logger with graphical display. Manual and auto data storage. Min/Max/Avg history may be re y off except for 2 and 5 second intervals (code version 4.18 and later). Data capacity shown.
ta Upload & Bluetooth® Data Connect Option										•	•	•		Bluetooth Data Trans	fer Option: Adjustable		io range from up to 30 ft 9 meters. Inc	fividual unit ID and 4-digit PIN code preprogrammed for easy identification and data security w
Clock / Calendar	•	٠	•	•	•									Requires optional PC in	terface (USB or RS-23	rial Port Protocol for data trans 32) or Bluetooth data transfer 32) or Bluetooth data transfer	option and provided software.	
Auto Shutdown	٠	٠	•	•	•	•								Requires optional PC in	terface (USB or RS-23	 32) or Bluetooth data transfer 32) or Bluetooth data transfer 32) or Bluetooth data transfer 	option and provided software.	
Languages Certifications	•			•		•							•	English, French, Germa	n, Italian, Spanish.		ble standards (written certificate of tes	ts available at additional charge).
Origin Battery Life	•	•	:	:			•		٠	•	•	•	•	Designed and manufact CR2032, one, included.	ured in the USA from I Average life, 300 hour	JS and imported components. s. Battery life reduced by back	Complies with Regional Value Content klight use in 2000 to 3500 models.	t and Tariff Code Transformation requirements for NAFTA Preference Criterion B.
Shock Resistance	•					•	•				•	:		Standard Models: AA MIL-STD-810g, Transit	A Alkaline, two, include Shock, Method 516.5	d. Average life, 400 hours of u	use, reduced by backlight or Bluetooth t may damage replaceable impeller.	radio transmission use.
Sealing	•					•	•		•		•	•		Waterproof (IP67 and N 14° F to 131° F -10 °C	EMA-6). to 55 °C Measureme	nts may be taken beyond the li	imits of the operational temperature ra	nge of the display and batteries by maintaining the unit within the operational range and expos
Operational Temperature			575	CONTRACTOR OF STREET			J. S. S.	200			THE R		1	to the more extreme env	ironment for the minim	num time necessary to take rea	ading.	
Operational Temperature Limits Storage Temperature		•	•	•							•			-22.0 °F to 140.0 °F -3	0.0 °C to 60.0 °C	102 g (including slip-on cover)		

^{*} NOTE: Accuracy calculated as uncertainty of the measurement derived from statistical analysis considering the comined effects from primary sensor specifications, circuit conversions, and all other sources of error using a coverage factor of k=2, or two standard deviations (2Σ).

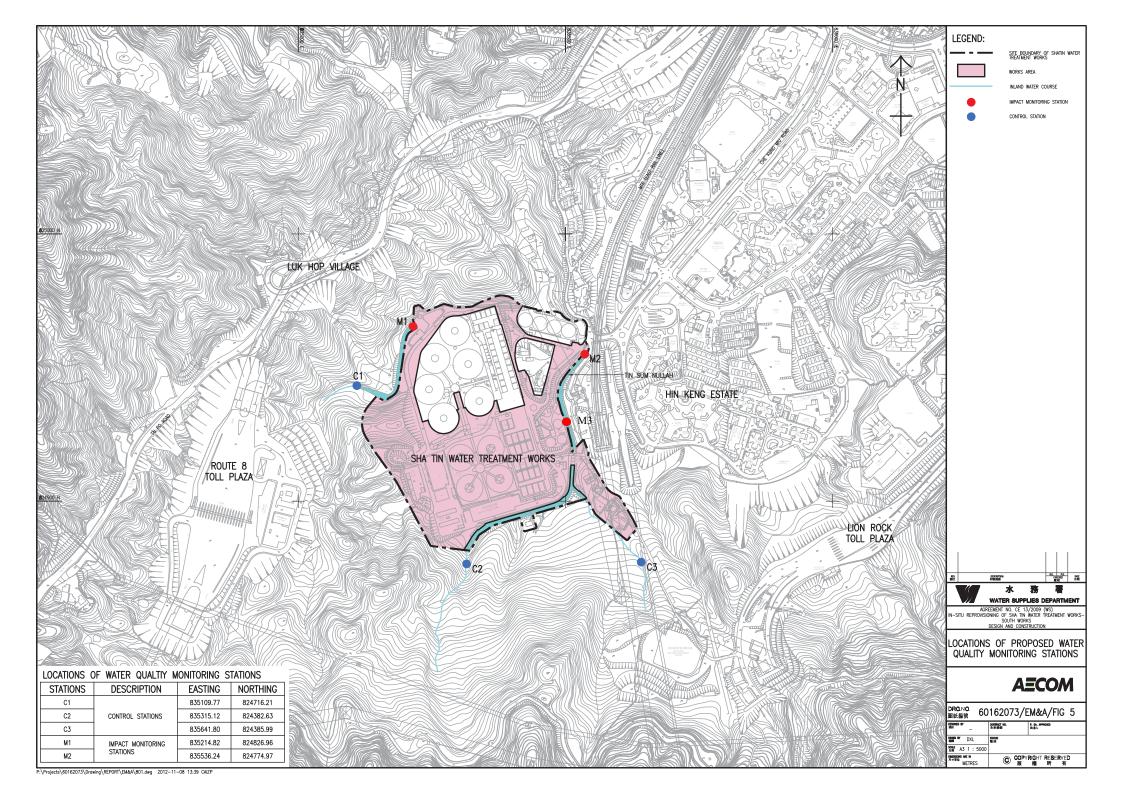
Appendix N Impact Noise Monitoring Results and Graphical Presentation







Appendix O Location Plan of Water Quality Monitoring Station



Appendix P Calibration Certificate (Water Quality)

Lot 12, Tam Kon Shan Road, Tsing Yi (N), Hong Kong Tel: (852) 2333 6823 Fax: (852) 2333 1316

Page 1 of 2

Test Report

Job Number : CJO-3113

Completion Date : 25/2/2017

Client Information

Company/ Organization : Acumen Environmental Engineering and Technologies

Co. Ltd.

Address : No. 12, Tam Kon Shan Road, Tsing Yi (North), N.T.

Project Name : CJO-3113-180

Sample Description : Certificate of Reference Check

Test Information

Laboratory ID : R170087/6

Item : YSI ProDSS Multi-parameter Water Quality Monitoring

System

Serial No. : 16A101332

Receive Date : 24/2/2017

Test Period : 25/2/2017-25/2/2017

Test Result : The results are presented on page 2

Authorized Signature:

Hui Wai Fung, Huntington

Laboratory Manager

Chemical Division

Acumen Laboratory and Testing Ltd. Lot 12, Tam Kon Shan Road, Tsing Yi (N), Hong Kong

Fax: (852) 2333 1316 Tel: (852) 2333 6823

Page 2 of 2

Test Report

Job Number : CJO-3113

Completion Date : 25/2/2017

Test Result:

	T	1
n	٠	-1
	1	J

Reference Reading	Recorded Reading
4.00	4.08
7.00	7.04
10.00	9.92
Allowing Deviation	±0.2 unit

Testing Method:

APHA 4500-H*B

Temperature

Reference Reading	Recorded Reading
8.0℃	7.2℃
25.0℃	24.1℃
42.0°C	42.3℃
Allowing Deviation	±2.0°℃

Testing Method:

In-house method

Turbidity

Reference Reading	Recorded Reading
0.0NTU	0.0NTU
4.0NTU	3.7NTU
40.0NTU	39.6NTU
80.0NTU	79.1NTU
400.0NTU	396.9NTU
800.0NTU	803.2NTU
Allowing Deviation	±10%

Testing Method: **APHA 2130B**

Dissolved Oxygen

Reference Reading	Recorded Reading
3.30mg/L	3.34mg/L
5.90mg/L	5.85mg/L
8.20mg/L	8.33mg/L
Allowing Deviation	±0.2mg/L

Testing Method: APHA 4500-OC & G

-----End of Report-----

Appendix Q The Certification of Laboratory with HOKLAS accredited Analytical Tests



Hong Kong Accreditation Service 香港認可處

Certificate of Accreditation

認可證書

This is to certify that 特此證明

ACUMEN LABORATORY AND TESTING LIMITED

浩科檢測中心有限公司

Lot 12, Tam Kon Shan Road, North Tsing Yi, New Territories, Hong Kong 香港新界青衣北担杆山路12路段

has been accepted by the HKAS Executive, on the recommendation of the Accreditation Advisory Board, as a 在認可諮詢委員會的建議下獲香港認可處執行機關接受為

HOKLAS Accredited Laboratory 「香港實驗所認可計劃」認可實驗所

This laboratory meets the requirements of ISO/IEC 17025:2005 and it has been accredited for performing specific tests or calibrations as listed in the scope of accreditation within the test category of

Environmental Testing

此實驗所符合ISO/IEC 17025:2005所訂的要求 並獲認可進行載於認可範圍內下述測試類別中的指定測試或校正工作

環境測試

This accreditation to ISC/IEC 17025:2005 demonstrates technical competence for a defined scope and the operation of a laboratory quality management system (see joint IAF-ILAC-ISO Communiqué). 此項 ISC/IEC 17025:2005 的部可資格證明此實驗所是明存機能完整時內所領的技術能力並實施一套實驗所質量管理體系(見圖際認可論壇、國際實驗所認可合作組織及圖際標準化組織的聯合公報)。

The common seal of the Hong Kong Accreditation Service is affixed hereto by the authority of the HKAS Executive 現經香港認可處執行機關授權在此蓋上香港認可處的印章

WONG Wang-wan, Executive Administrator

報行幹事 黄宏華 Issue Date: 16 July 2014 簽發日期: 二零一四年七月十六日

Registration Number: HOKLAS 241

Date of First Registration: 16 July 2014 首次註冊日期:二零一四年七月十六日

This certificate is issued subject to the terms and conditions laid down by HKAS 本證書按照香港認可處訂立的條款及條件發出

L 001195

Appendix R Impact Water Quality Monitoring Results

Date	Time	Weather	Location	Co-ore	dinates	Water Depth	Sample Depth	Te	mp.	DO	con.	DO Sat	uration	Tur	bidity	r	Н	SS
				East	North	m	m	0	С	m	g/L	Ç	%	N	TU	u	nit	mg/L
	9:13	Cloudy	C1	835110	824716	0.04	0.02	18.7	18.8	8.05	8.03	98.1	98.1	2.7		7.82	7.82	2.5
	9:30	Cloudy	C2	835403	824470	0.02	0.01	19.3	19.2	8.75	8.76	99.3	99.4	2.2	2.2	8.37	8.39	2.3
1/3/2017	N/A	N/A	C3	835642	824386	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
1/3/2017	9:49	Cloudy	M1	835215	824827	0.8	0.4	18.0	18.2	8.99	8.97	97.6	97.6	2.9	2.9	7.60	7.61	3.2
	9:59	Cloudy	M2	835536	824775	0.05	0.025	20.0	20.1	9.08	9.07	97	97	5.7	5.6	8.64	8.65	4.9
	10:06	Cloudy	M3	835501	824648	0.02	0.01	20.3	20.3	9.19	9.19	99.1	99.1	0.7	0.7	8.17	8.18	<1
		Cloudy	C1	835110	824716	0.04	0.02	21.6	21.6	8.28	8.27	93.8	94	1.8		7.74	7.74	3.1
	15:28	Cloudy	C2	835403	824470	0.02	0.01	21.0	21.0	8.91	8.90	99.9	99.9	2.8		8.57	8.57	3.0
3/3/2017	N/A	N/A	C3	835642	824386	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
3/3/2017	15:40	Cloudy	M1	835215	824827	0.8	0.4	21.7	21.8	8.91	8.92	101.3	101.4	2.7	2.7	7.72	7.72	2.6
		Cloudy	M2	835536	824775	0.05	0.025	20.9	20.9	8.99	9.00	99.7	99.9	2.4		8.58	8.58	5.4
	16:04	Cloudy	M3	835501	824648	0.02	0.01	21.2	21.2	9.20	9.18	98.8	98.8	0.9	0.9	8.49	8.49	<1
	10.05	5	G1	005110	00.471.5	0.01	0.00	21.5	21.5	0 : 5	0 :-	05.0	0.0	1.3	1.3	F. 60	7.63	2.2
		Sunny	C1	835110	824716	0.04	0.02	21.6	21.7	8.45	8.45	95.9	96			7.63	7.63	2.3
		Sunny	C2	835403	824470	0.02	0.01	21.0	21.0	8.60	8.60	99.2	99.2	2.9		7.98	7.99	3.6
6/3/2017	N/A	N/A	C3	835642	824386	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
		Sunny	M1	835215	824827	0.8	0.4	21.7	21.7	9.20	9.21	93.3	93.3	1.1	1.1	7.94	7.95	3.1
		Sunny	M2	835536	824775	0.05	0.025	20.9	20.9	8.97	8.98	99.9	99.9	7.9		8.54	8.54	5.8
	14:18	Sunny	M3	835501	824648	0.02	0.01	21.1	21.1	9.25	9.25	99.4	99.5	0.6	0.6	7.71	7.71	<1
	14.17	Cloudy	C1	835110	824716	0.04	0.02	20.0	20.1	7.84	7.84	96.5	96.5	2.7	2.7	7.69	7.69	2.4
	14:17	Cloudy	C2	835403	824470	0.04	0.02	21.7	21.6	8.17	8.17	98.2	98.2	3.0		8.21	8.21	3.2
	N/A	N/A	C3	835642	824386	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
8/3/2017		Cloudy	M1	835215	824827	0.8	0.4	20.4	20.4	9.23	9.23	94.5	94.7	2.2		7.60	7.60	2.9
		Cloudy	M2	835536	824775	0.05	0.025	21.0	21.1	9.06	9.05	98	97.8	5.9		8.57	8.58	5.0
		Cloudy	M3	835501	824648	0.02	0.023	20.5	20.4	9.19	9.19	98.1	98.3	0.8		7.98	7.98	<1
	15.07	Cloudy	1413	055501	021010	0.02	0.01	20.5	20.1	7.17	7.17	70.1	70.5	0.0	0.0	7.50	7.50	XI
	15:40	Sunny	C1	835110	824716	0.04	0.02	19.8	19.8	7.82	7.82	96	96	3.4	3.4	7.57	7.57	3.7
	15:58	Sunny	C2	835403	824470	0.02	0.01	18.7	18.8	9.04	9.04	99.7	99.7	2,9		8.03	8.04	3.0
10/0/2017	N/A	N/A	C3	835642	824386	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
10/3/2017	16:07	Sunny	M1	835215	824827	0.8	0.4	19.3	19.4	8.94	8.93	96.4	96.5	2.9	2.8	8.14	8.14	3.2
	16:21	Sunny	M2	835536	824775	0.05	0.025	20.0	20.1	9.00	9.01	96.4	96.4	8.1	8.2	7.72	7.72	4.8
		Sunny	M3	835501	824648	0.02	0.01	19.6	19.5	9.21	9.19	98.6	98.6	0.7	0.8	8.31	8.31	<1
	14:07	Cloudy	C1	835110	824716	0.04	0.02	19.7	19.7	7.92	7.92	97.6	97.6	2.8	2.8	7.42	7.42	4.0
	14:21	Cloudy	C2	835403	824470	0.02	0.01	20.0	20.0	8.17	8.17	98.2	98.2	2.7	2.7	7.58	7.58	2.3
13/3/2017	N/A	N/A	C3	835642	824386	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
13/3/2017	14:40	Cloudy	M1	835215	824827	0.8	0.4	20.3	20.3	9.14	9.13	96.5	96.3	3.1	3.1	8.16	8.16	3.2
		Cloudy	M2	835536	824775	0.05	0.025	21.3	21.4	9.18	9.17	96.4	96.4	5.7		9.06	9.06	5.0
	15:04	Cloudy	M3	835501	824648	0.02	0.01	20.9	21.0	9.17	9.17	98.3	98.3	0.7	0.7	8.04	8.04	<1
				005:::	00/=:													2 -
		Sunny	C1	835110	824716	0.04	0.02	21.0	21.0	7.92	7.92	97.7	97.7	2.9		7.72	7.73	3.2
		Sunny	C2	835403	824470	0.02	0.01	20.8	20.8	8.64	8.64	97.9	97.9	3.0	-	8.65	8.63	3.0
15/3/2017	N/A	N/A	C3	835642	824386	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
		Sunny	M1	835215	824827	0.8	0.4	21.3	21.3	9.01	8.99	95.3	95.3	3.2		7.70	7.68	3.2
		Sunny	M2	835536	824775	0.05	0.025	20.0	20.0	9.08	9.07	100.4	100.4	3.6		8.73	8.73	5.2
	10:10	Sunny	M3	835501	824648	0.02	0.01	19.8	19.9	9.19	9.17	99.9	99.8	0.7	0.6	8.50	8.50	<1

	0.10	la l	CI	025110	004716	0.04	0.00	20.0	20.0	0.00	0.01	00.4	00.5	1.0	1.7	7.70	7.70	4.0
		Sunny	C1	835110	824716	0.04	0.02	20.9	20.9	8.22	8.21	99.4	99.5	1.8	1./	7.72	7.70	4.0
	9:29	Sunny	C2	835403	824470	0.02	0.01	21.4	21.5	8.30	8.30	95	94.9	2.5	2.5	8.78	8.78	2.1
17/3/2017	N/A	N/A	C3	835642	824386	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
177372017	9:47	Sunny	M1	835215	824827	0.8	0.4	21.0	20.9	9.07	9.07	99.9	100	2.3	2.3	7.21	7.21	2.0
	10:09	Sunny	M2	835536	824775	0.05	0.025	20.2	20.2	9.08	9.07	95.8	95.8	4.5	4.6	9.08	9.08	5.4
	10:14	Sunny	M3	835501	824648	0.02	0.01	22.3	22.3	9.23	9.20	96.3	96.3	0.9	0.8	8.57	8.59	<1
	8.58	Cloudy	C1	835110	824716	0.04	0.02	20.6	20.6	8.12	8.12	93.7	93.7	2.8	2.8	7.87	7.87	2.1
		Cloudy	C2	835403	824470	0.02	0.01	21.0	21.0	9.07	9.07	100.4	100.4	3.0			8.33	2.5
	N/A	N/A	C3	835642	824386	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
20/3/2017		Cloudy	M1	835215	824827	0.8	0.4		21.1	9.02	9.01	96.5	96.5	3.1	3.0	7.53	7.53	2.3
		Cloudy	M2	835536	824775	0.05	0.025	22.0	22.0	9.02	9.20	97.5	97.4	7.0		8.21	8.20	5.9
			M3	835501	824648	0.03	0.023		21.0	9.22		95.6	95.6	0.7		8.48	8.48	<1
	10:06	Cloudy	IVI 3	833301	824048	0.02	0.01	21.0	21.0	9.20	9.24	93.0	93.0	0.7	0.7	8.48	8.48	<1
	15.07	Classic	C1	025110	004716	0.04	0.00	20.7	20.7	0.00	0.00	07.7	07.7	0.0	2.4	7.00	7.00	2.2
		Cloudy	C1	835110	824716	0.04	0.02		20.7	8.92	8.92	97.7	97.7	2.3		7.80	7.80	3.3
		Cloudy	C2	835403	824470	0.02	0.01	21.7	21.8	9.10	9.10	98.9	99	0.0		8.10	8.11	3.5
22/3/2017	N/A	N/A	C3	835642	824386	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
		Cloudy	M1	835215	824827	0.8	0.4		22.0	8.92	8.92	96.7	96.7	3.2	3.2	8.13	8.15	3.2
		Cloudy	M2	835536	824775	0.05	0.025	21.5	21.6	9.14	9.14	99.2	99.1	5.9		7.60	7.59	4.8
	16:30	Cloudy	M3	835501	824648	0.02	0.01	20.7	20.7	9.21	9.20	96	96	0.7	0.7	7.64	7.65	<1
		Sunny	C1	835110	824716	0.04	0.02	19.0	18.9	7.59	7.57	96	95.9	2.8		7.57	7.57	3.6
	16:28	Sunny	C2	835403	824470	0.02	0.01	20.1	20.2	8.26	8.25	97.4	97.4	2.9	3.0	8.00	8.02	2.3
24/3/2017	N/A	N/A	C3	835642	824386	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
24/3/2017	16:45	Sunny	M1	835215	824827	0.8	0.4	18.7	18.8	9.27	9.23	98.4	98.4	3.7	3.8	8.01	8.00	3.1
	17:03	Sunny	M2	835536	824775	0.05	0.025	20.7	20.8	8.98	8.97	99.2	99.4	5.1	5.0	8.34	8.33	5.1
		Sunny	M3	835501	824648	0.02	0.01	19.8	19.8	9.28	9.27	96.2	96.2	0.6		7.62	7.62	<1
	8.58	Cloudy	C1	835110	824716	0.04	0.02	19.2	19.2	8.09	8.09	96.2	96.2	3.3	3.4	7.87	7.87	1.3
		Cloudy	C2	835403	824470	0.02	0.02	19.9	20.0	8.18	8.18	99.7	99.8	2.8		8.05	8.05	2.3
	N/A	N/A	C3	835642	824386	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
27/3/2017		Cloudy	M1	835215	824827	0.8	0.4		21.2	9.12	9.11	98.4	98.5	1.7	1.7	8.12	8.10	2.2
			M2	835536		0.05	0.025		22.0	9.12		99.4	99.3		7.1	7.65	7.66	4.0
		Cloudy			824775			21.9	18.7	9.19	9.16 9.22			7.1		7.53	7.53	
	10:02	Cloudy	M3	835501	824648	0.02	0.01	18.7	18./	9.24	9.22	101.3	101.3	0.8	0.8	1.33	1.53	<1
	16.10	C	C1	025110	004716	0.04	0.00	20.5	20.4	0.04	0.04	060	000	2.1	2.0	7.70	7.70	1.0
		Sunny	C1	835110	824716	0.04	0.02		20.4	8.04	8.04	96.8	96.9	3.1		7.79	7.79	1.8
		Sunny	C2	835403	824470	0.02	0.01	21.1	21.1	8.19	8.17	95.9	96	2.8		8.73	8.72	2.4
29/3/2017	N/A	N/A	C3	835642	824386	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
		Sunny	M1	835215	824827	0.8	0.4		21.4	9.14	9.13	95.9	95.9	2.6		7.48	7.47	2.6
		Sunny	M2	835536	824775	0.05	0.025	21.6	21.6	9.10	9.10	100.7	100.5	5.2		8.41	8.41	4.6
	17:18	Sunny	M3	835501	824648	0.02	0.01	21.3	21.3	9.19	9.18	96.4	96.4	0.7	0.7	7.68	7.68	<1
	14:20	Cloudy	C1	835110	824716	0.04	0.02	19.7	19.7	8.24	8.24	99.3	99.4	2.7		7.81	7.80	2.0
	14:40	Cloudy	C2	835403	824470	0.02	0.01	19.4	19.4	8.94	8.94	100.7	100.8	2.8	2.8	7.69	7.69	2.3
21/2/2017	N/A	N/A	C3	835642	824386	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
31/3/2017	14:58	Cloudy	M1	835215	824827	0.8	0.4	20.0	19.9	9.05	9.06	95.4	95.6	1.7	1.7	7.59	7.60	2.4
	15:09	Cloudy	M2	835536	824775	0.05	0.025	18.4	18.4	9.17	9.17	98.6	98.6	6.1	6.0	7.21	7.22	5.8
		Cloudy	M3	835501	824648	0.02	0.01	19.4	19.4	9.20	9.19	99.4	99.4	0.6		8.09	8.09	<1
	15.10	Cioudy	1717	100001	047070	0.02	0.01	17.4	17.4	7.20	7.17	<i>//.</i> +	//. T	0.0	0.7	0.07	0.07	\ 1

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Test Report

Page 1 of 2

Report Number

: Q170003aR170127

Job Number

: R170127

Issue Date

: 06/04/2017

Name of Applicant

: Acumen Environmental Engineering and Technologies Co., Ltd.

Address of Applicant

: No. 12, Tam Kon Shan Road, Tsing Yi (North), N.T.

Project Name

: CJO-3113-181

Sample Description

: SS test

Laboratory ID

: R170127/1-5

Date of Sampling

: 01/03/2017

Date Received

: 01/03/2017

Test Period

: 01/03/2017-02/03/2017

Test Required

: 1. Suspended Solids (SS)

Method Used

: 1. QPL-15e, APHA 22ed 2540 D

Test Result

: Refer to the results on page 2.

For and on behalf of

Acumen Laboratory and Testing Limited

Authorized Signature:

Hui Wai Fung, Huntington

Laboratory Manager

Chemical Division

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Test Report

Page 2 of 2

Report Number

: Q170003aR170127

Job Number

: R170127

Issue Date

: 06/04/2017

Test Result:

Lab ID	Date of Sampling	Client Sample ID	Suspended Solids (SS), mg/L
R170127/1	01/03/2017	C1	2.5
R170127/2	01/03/2017	C2	2.3
R170127/3	01/03/2017	М1	3.2
R170127/4	01/03/2017	M2	4.9
R170127/5	01/03/2017	МЗ	<1

Note:

- 1. mg/L indicates milligram per liter
 2. mg O₂/ L indicates milligram oxygen per liter
- 3. < indicates less than. 4. > indicates more than.
- 5. NA indicates Not Applicable.

End of Report

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Test Report

Page 1 of 2

Report Number

: Q170003aR170128

Job Number

: R170128

Issue Date

: 06/04/2017

Name of Applicant

: Acumen Environmental Engineering and Technologies Co., Ltd.

Address of Applicant

: No. 12, Tam Kon Shan Road, Tsing Yi (North), N.T.

Project Name

: CJO-3113-182

Sample Description

: SS test

Laboratory ID

: R170128/1-5

Date of Sampling

: 03/03/2017

Date Received

: 03/03/2017

Test Period

: 03/03/2017-04/03/2017

Test Required

: 1. Suspended Solids (SS)

Method Used

: 1. QPL-15e, APHA 22ed 2540 D

Test Result

: Refer to the results on page 2.

For and on behalf of

Acumen Laboratory and Testing Limited

Authorized Signature:

Hui Wai Fung, Huntington

Laboratory Manager

Chemical Division

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Test Report

Page 2 of 2

Report Number

: Q170003aR170128

Job Number

: R170128

Issue Date

: 06/04/2017

Test Result:

Lab ID	Date of Sampling	Client Sample ID	Suspended Solids (SS), mg/L
R170128/1	03/03/2017	C1	3.1
R170128/2	03/03/2017	C2	3.0
R170128/3	03/03/2017	М1	2.6
R170128/4	03/03/2017	М2	5.4
R170128/5	03/03/2017	МЗ	<1

Note:

- 1. mg/L indicates milligram per liter
- 2. mg O₂/ L indicates milligram oxygen per liter
- 3. < indicates less than.
- 4. > indicates more than.
- 5. NA indicates Not Applicable.

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Test Report

Page 1 of 2

Report Number

: Q170003aR170129

Job Number

: R170129

Issue Date

: 06/04/2017

Name of Applicant

: Acumen Environmental Engineering and Technologies Co., Ltd.

Address of Applicant

: No. 12, Tam Kon Shan Road, Tsing Yi (North), N.T.

Project Name

: CJO-3113-183

Sample Description

: SS test

Laboratory ID

: R170129/1-5

Date of Sampling

: 06/03/2017

Date Received

: 06/03/2017

Test Period

: 06/03/2017-07/03/2017

Test Required

: 1. Suspended Solids (SS)

Method Used

: 1. QPL-15e, APHA 22ed 2540 D

Test Result

: Refer to the results on page 2.

For and on behalf of

Acumen Laboratory and Testing Limited

Authorized Signature:

Hui Wai Fung, Huntington

Laboratory Manager

Chemical Division

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Test Report

Page 2 of 2

Report Number

: Q170003aR170129

Job Number

: R170129

Issue Date

: 06/04/2017

Test Result:

Lab ID	Date of Sampling	Client Sample ID	Suspended Solids (SS), mg/L
R170129/1	06/03/2017	C1	2.3
R170129/2	06/03/2017	C2	3.6
R170129/3	06/03/2017	M1	3.1
R170129/4	06/03/2017	M2	5.8
R170129/5	06/03/2017	М3	<1

Note:

- 1. mg/L indicates milligram per liter
- 2. mg O₂/ L indicates milligram oxygen per liter
- 3. < indicates less than.
- 4. > indicates more than.
- 5. NA indicates Not Applicable.

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Test Report

Page 1 of 2

Report Number

: Q170003aR170130

Job Number

: R170130

Issue Date

: 06/04/2017

Name of Applicant

: Acumen Environmental Engineering and Technologies Co., Ltd.

Address of Applicant

: No. 12, Tam Kon Shan Road, Tsing Yi (North), N.T.

Project Name

: CJO-3113-184

Sample Description

: SS test

Laboratory ID

: R170130/1-5

Date of Sampling

: 08/03/2017

Date Received

: 08/03/2017

Test Period

: 08/03/2017-09/03/2017

Test Required

: 1. Suspended Solids (SS)

Method Used

: 1. QPL-15e, APHA 22ed 2540 D

Test Result

: Refer to the results on page 2.

For and on behalf of

Acumen Laboratory and Testing Limited

Authorized Signature:

Hui Wai Fung, Huntington

Laboratory Manager

Chemical Division

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Test Report

Page 2 of 2

Report Number

: Q170003aR170130

Job Number

: R170130

Issue Date

: 06/04/2017

Test Result:

Lab ID	Date of Sampling ຸ	Client Sample ID	Suspended Solids (SS), mg/L
R170130/1	08/03/2017	C1	2.4
R170130/2	08/03/2017	C2	3.2
R170130/3	08/03/2017	M1	2.9
R170130/4	08/03/2017	M2	5.0
R170130/5	08/03/2017	M3	<1

Note:

- 1. mg/L indicates milligram per liter
- 2. mg O₂/L indicates milligram oxygen per liter
- 3. < indicates less than.
- 4. > indicates more than.
- 5. NA indicates Not Applicable.

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Test Report

Page 1 of 2

Report Number

: Q170003aR170131

Job Number

: R170131

Issue Date

: 06/04/2017

Name of Applicant

: Acumen Environmental Engineering and Technologies Co., Ltd.

Address of Applicant

: No. 12, Tam Kon Shan Road, Tsing Yi (North), N.T.

Project Name

: CJO-3113-185

Sample Description

: SS test

Laboratory ID

: R170131/1-5

Date of Sampling

: 10/03/2017

Date Received

: 10/03/2017

Test Period

: 10/03/2017-11/03/2017

Test Required

: 1. Suspended Solids (SS)

Method Used

: 1. QPL-15e, APHA 22ed 2540 D

Test Result

: Refer to the results on page 2.

For and on behalf of

Acumen Laboratory and Testing Limited

Authorized Signature:

Hui Wai Fung, Huntington

Laboratory Manager

Chemical Division

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Test Report

Page 2 of 2

Report Number

: Q170003aR170131

Job Number

: R170131

Issue Date

: 06/04/2017

Test Result:

Lab ID	Date of Sampling	Client Sample ID	Suspended Solids (SS), mg/L
R170131/1	10/03/2017	C1	3.7
R170131/2	10/03/2017	C2	3.0
R170131/3	10/03/2017	M1	3.2
R170131/4	10/03/2017	M2	4.8
R170131/5	10/03/2017	M3	<1

Note:

- 1. mg/L indicates milligram per liter
 2. mg O₂/ L indicates milligram oxygen per liter
- 3. < indicates less than.
- 4. > indicates more than.
- 5. NA indicates Not Applicable.

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Test Report

Page 1 of 2

Report Number : Q170003aR170142

Job Number : R170142

Issue Date : 06/04/2017

Name of Applicant : Acumen Environmental Engineering and Technologies Co., Ltd.

Address of Applicant: No. 12, Tam Kon Shan Road, Tsing Yi (North), N.T.

Project Name : CJO-3113-186

Sample Description : SS test

Laboratory ID : R170142/1-5

Date of Sampling : 13/03/2017 Date Received : 13/03/2017

Test Period : 13/03/2017–14/03/2017

Test Required : 1. Suspended Solids (SS)

Method Used : 1. QPL-15e, APHA 22ed 2540 D

Test Result : Refer to the results on page 2.

For and on behalf of

Acumen Laboratory and Testing Limited

Authorized Signature:

Hui Wai Fung, Huntington

Laboratory Manager

Chemical Division

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Test Report

Page 2 of 2

Report Number : Q170003aR170142

Job Number : R170142

Issue Date : 06/04/2017

Test Result:

Lab ID	Date of Sampling	Client Sample ID	Suspended Solids (SS), mg/L
R170142/1	13/03/2017	C1	4.0
R170142/2	13/03/2017	C2	2.3
R170142/3	13/03/2017	М1	3.2
R170142/4	13/03/2017	М2	5.0
R170142/5	13/03/2017	М3	<1

Note:

- 1. mg/L indicates milligram per liter
- 2. mg O₂/ L indicates milligram oxygen per liter
- 3. < indicates less than.
- 4. > indicates more than.
- 5. NA indicates Not Applicable.

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Test Report

Page 1 of 2

Report Number

: Q170003aR170143

Job Number

: R170143

Issue Date

: 06/04/2017

Name of Applicant

: Acumen Environmental Engineering and Technologies Co., Ltd.

Address of Applicant

: No. 12, Tam Kon Shan Road, Tsing Yi (North), N.T.

Project Name

: CJO-3113-187

Sample Description

: SS test

Laboratory ID

: R170143/1-5

Date of Sampling

: 15/03/2017

Date Received

: 15/03/2017

Test Period

: 15/03/2017-16/03/2017

Test Required

: 1. Suspended Solids (SS)

Method Used

: 1. QPL-15e, APHA 22ed 2540 D

Test Result

: Refer to the results on page 2.

For and on behalf of

Acumen Laboratory and Testing Limited

Authorized Signature:

Hui Wai Fung, Huntington

Laboratory Manager

Chemical Division

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Test Report

Page 2 of 2

Report Number : Q170003aR170143

Job Number : R170143

Issue Date : 06/04/2017

Test Result:

TOOTITOOGIVE			
Lab ID	Date of Sampling	Client Sample ID	Suspended Solids (SS), mg/L
R170143/1	15/03/2017	C1	3.2
R170143/2	15/03/2017	C2	3.0
R170143/3	15/03/2017	М1	3.2
R170143/4	15/03/2017	M2	5.2
R170143/5	15/03/2017	М3	<1

Note:

- 1. mg/L indicates milligram per liter
- 2, mg O₂/ L indicates milligram oxygen per liter
- 3. < indicates less than.
- 4. > indicates more than.
- 5. NA indicates Not Applicable.

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Test Report

Page 1 of 2

Report Number

: Q170003aR170144

Job Number

: R170144

Issue Date

: 06/04/2017

Name of Applicant

: Acumen Environmental Engineering and Technologies Co., Ltd.

Address of Applicant

: No. 12, Tam Kon Shan Road, Tsing Yi (North), N.T.

Project Name

: CJO-3113-188

Sample Description

: SS test

Laboratory ID

: R170144/1-5

Date of Sampling

: 17/03/2017

Date Received

: 17/03/2017

Test Period

: 17/03/2017–18/03/2017

Test Required

: 1. Suspended Solids (SS)

Method Used

: 1. QPL-15e, APHA 22ed 2540 D

Test Result

: Refer to the results on page 2.

For and on behalf of

Acumen Laboratory and Testing Limited

Authorized Signature:

Hui Wai Fung, Huntington

Laboratory Manager

Chemical Division

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Test Report

Page 2 of 2

Report Number

: Q170003aR170144

Job Number

: R170144

Issue Date

: 06/04/2017

Test Result:

Lab ID	Date of Sampling	Client Sample ID	Suspended Solids (SS), mg/L
R170144/1	17/03/2017	C1	4.0
R170144/2	17/03/2017	C2	2.1
R170144/3	17/03/2017	M1	2.0
R170144/4	17/03/2017	M2	5.4
R170144/5	17/03/2017	M3	<1

Note:

- 1. mg/L indicates milligram per liter
- 2. mg O₂/ L indicates milligram oxygen per liter
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- 5. NA indicates Not Applicable.

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Test Report

Page 1 of 2

Report Number : Q170003aR170152

Job Number : R170152

Issue Date : 06/04/2017

Name of Applicant : Acumen Environmental Engineering and Technologies Co., Ltd.

Address of Applicant : No. 12, Tam Kon Shan Road, Tsing Yi (North), N.T.

Project Name : CJO-3113-189

Sample Description : SS test

Laboratory ID : R170152/1-5

Date of Sampling : 20/03/2017

Date Received : 20/03/2017

Test Period : 20/03/2017–20/03/2017

Test Required : 1. Suspended Solids (SS)

Method Used : 1. QPL-15e, APHA 22ed 2540 D

Test Result : Refer to the results on page 2.

For and on behalf of

Acumen Laboratory and Testing Limited

Authorized Signature:

Hui Wai Fung, Huntington

Laboratory Manager Chemical Division

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Test Report

Page 2 of 2

Report Number

: Q170003aR170152

Job Number

: R170152

Issue Date

: 06/04/2017

Test Result:

Lab ID	Date of Sampling	Client Sample ID	Suspended Solids (SS), mg/L
R170152/1	20/03/2017	C1	2.1
R170152/2	20/03/2017	C2	2.5
R170152/3	20/03/2017	M1	2.3
R170152/4	20/03/2017	M2	5.9
R170152/5	20/03/2017	М3	<1

Note:

- 1. mg/L indicates milligram per liter
- 2. mg O₂/ L indicates milligram oxygen per liter
- 3. < indicates less than.
- 4. > indicates more than.
- 5. NA indicates Not Applicable.

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Test Report

Page 1 of 2

Report Number : Q170003aR170153

Job Number : R170153

Issue Date : 06/04/2017

Name of Applicant : Acumen Environmental Engineering and Technologies Co., Ltd.

Address of Applicant : No. 12, Tam Kon Shan Road, Tsing Yi (North), N.T.

Project Name : CJO-3113-190

Sample Description : SS test

Laboratory ID : R170153/1-5

Date of Sampling : 22/03/2017 Date Received : 22/03/2017

Test Period : 22/03/2017–23/03/2017

Test Required : 1. Suspended Solids (SS)

Method Used : 1. QPL-15e, APHA 22ed 2540 D

Test Result : Refer to the results on page 2.

For and on behalf of

Acumen Laboratory and Testing Limited

Authorized Signature:

Hui Wai Fung, Huntington

Laboratory Manager Chemical Division

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Test Report

Page 2 of 2

Report Number : Q170003aR170153

Job Number : R170153

Issue Date : 06/04/2017

Test Result:

Lab ID	Date of Sampling	Client Sample ID	Suspended Solids (SS), mg/L
R170153/1	22/03/2017	C1	3.3
R170153/2	22/03/2017	C2	3.5
R170153/3	22/03/2017	M1	3.2
R170153/4	22/03/2017	M2	4.8
R170153/5	22/03/2017	M3	<1

Note:

- 1. mg/L indicates milligram per liter
- 2. mg O₂/ L indicates milligram oxygen per liter

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- 4. > indicates more than.
- 5. NA indicates Not Applicable.

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Test Report

Page 1 of 2

Report Number

: Q170003aR170154

Job Number

: R170154

Issue Date

: 06/04/2017

Name of Applicant

: Acumen Environmental Engineering and Technologies Co., Ltd.

Address of Applicant

: No. 12, Tam Kon Shan Road, Tsing Yi (North), N.T.

Project Name

: CJO-3113-191

Sample Description

: SS test

Laboratory ID

: R170154/1-5

Date of Sampling

: 24/03/2017

Date Received

: 24/03/2017

Test Period

: 24/03/2017-25/03/2017

Test Required

: 1. Suspended Solids (SS)

Method Used

: 1. QPL-15e, APHA 22ed 2540 D

Test Result

: Refer to the results on page 2.

For and on behalf of

Acumen Laboratory and Testing Limited

Authorized Signature:

Hui Wai Fung, Huntington

Laboratory Manager

Chemical Division

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Test Report

Page 2 of 2

Report Number

: Q170003aR170154

Job Number

: R170154

Issue Date

: 06/04/2017

Test Result:

Lab ID	Date of Sampling	Client Sample ID	Suspended Solids (SS), mg/L
R170154/1	24/03/2017	C1	3.6
R170154/2	24/03/2017	C2	2.3
R170154/3	24/03/2017	М1	3.1
R170154/4	24/03/2017	M2	5.1
R170154/5	24/03/2017	МЗ	<1

Note:

- 1. mg/L indicates milligram per liter
 2. mg O₂/ L indicates milligram oxygen per liter
- 3. < indicates less than.
- 4. > indicates more than.
- 5. NA indicates Not Applicable.

End of Report

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Test Report

Page 1 of 2

Report Number : Q170003aR170161

Job Number : R170161

Issue Date : 06/04/2017

Name of Applicant : Acumen Environmental Engineering and Technologies Co., Ltd.

Address of Applicant: No. 12, Tam Kon Shan Road, Tsing Yi (North), N.T.

Project Name : CJO-3113-192

Sample Description : SS test

Laboratory ID : R170161/1-5

Date of Sampling : 27/03/2017

Date Received : 27/03/2017

Test Period : 27/03/2017–28/03/2017

Test Required : 1. Suspended Solids (SS)

Method Used : 1. QPL-15e, APHA 22ed 2540 D

Test Result : Refer to the results on page 2.

For and on behalf of

Acumen Laboratory and Testing Limited

Authorized Signature:

Hui Wai Fung, Huntington

Laboratory Manager Chemical Division

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Test Report

Page 2 of 2

Report Number

: Q170003aR170161

Job Number

: R170161

Issue Date

: 06/04/2017

Test Result:

Lab ID	Date of Sampling	Client Sample ID	Suspended Solids (SS), mg/L
R170161/1	27/03/2017	C1	1.3
R170161/2	27/03/2017	C2	2.3
R170161/3	27/03/2017	M1	2.2
R170161/4	27/03/2017	M2	4.0
R170161/5	27/03/2017	M3	<1

Note:

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- 3. < indicates less than.
- 4. > indicates more than.
- 5. NA indicates Not Applicable.

End of Report

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Test Report

Page 1 of 2

Report Number : Q170003aR170162

Job Number : R170162

Issue Date : 06/04/2017

Name of Applicant : Acumen Environmental Engineering and Technologies Co., Ltd.

Address of Applicant: No. 12, Tam Kon Shan Road, Tsing Yi (North), N.T.

Project Name : CJO-3113-193

Sample Description : SS test

Laboratory ID : R170162/1-5

Date of Sampling : 29/03/2017 Date Received : 29/03/2017

Test Period : 29/03/2017–30/03/2017

Test Required : 1. Suspended Solids (SS)

Method Used : 1. QPL-15e, APHA 22ed 2540 D

Test Result : Refer to the results on page 2.

For and on behalf of

Acumen Laboratory and Testing Limited

Authorized Signature:

Hui Wai Fung, Huntington

Laboratory Manager
Chemical Division

Offermour Britister

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E-mail: htthui@acumenhk.com / jleung@acumenhk.com

Lot 12, Tam Kon Shan Road, Tsing Yi (N), Hong Kong Tel: (852) 2333 6823 Fax: (852) 2333 1316

Test Report

Page 2 of 2

Report Number

: Q170003aR170162

Job Number

: R170162

Issue Date

: 06/04/2017

Test Result:

Lab ID	Date of Sampling	Client Sample ID	Suspended Solids (SS), mg/L
R170162/1	29/03/2017	C1	1.8
R170162/2	29/03/2017	C2	2.4
R170162/3	29/03/2017	M1	2.6
R170162/4	29/03/2017	M2	4.6
R170162/5	29/03/2017	МЗ	<1

Note:

- 1. mg/L indicates milligram per liter
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- 3. < indicates less than.
- 4. > indicates more than.
- 5. NA indicates Not Applicable.

End of Report

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Test Report

Page 1 of 2

Report Number

: Q170003aR170163

Job Number

: R170163

Issue Date

: 06/04/2017

Name of Applicant

: Acumen Environmental Engineering and Technologies Co., Ltd.

Address of Applicant

: No. 12, Tam Kon Shan Road, Tsing Yi (North), N.T.

Project Name

: CJO-3113-194

Sample Description

: SS test

Laboratory ID

: R170163/1-5

Date of Sampling

: 31/03/2017

Date Received

: 31/03/2017

Test Period

: 31/03/2017-01/04/2017

Test Required

: 1. Suspended Solids (SS)

Method Used

: 1. QPL-15e, APHA 22ed 2540 D

Test Result

: Refer to the results on page 2.

For and on behalf of

Acumen Laboratory and Testing Limited

Authorized Signature:

Hui Wai Fung, Huntington

Laboratory Manager

Chemical Division

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Tel: (852) 2333 6823 Fax: (852) 2333 1316

Test Report

Page 2 of 2

Report Number

: Q170003aR170163

Job Number

: R170163

Issue Date

: 06/04/2017

Test Result:

Lab ID	Date of Sampling	Client Sample ID	Suspended Solids (SS), mg/L
R170163/1	31/03/2017	C1	2.0
R170163/2	31/03/2017	C2	2.3
R170163/3	31/03/2017	M1	2.4
R170163/4	31/03/2017	M2	5.8
R170163/5	31/03/2017	M3	<1

Note:

- 1. mg/L indicates milligram per liter
- 2. mg O₂/ L indicates milligram oxygen per liter
- 3. < indicates less than.
- 4. > indicates more than.
- 5. NA indicates Not Applicable.

End of Report

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Appendix S Impact Monitoring report for Ecology

Project no.: CJO-3113

Post-Transplantation Monitoring Report

for Agreement No. CE 13/2009 (WS)

IN-SITU REPROVISIONING OF SHA TIN WATER TREATMENT WORKS – SOUTH WORKS

Report No.27

04 March 2017

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APPENDICES

APPENDIX I- Photos

APPENDIX II- Table for condition of transplanted plant

1. INTRODUCTION

- 1.1 Pursuant to the Environmental Impact Assessment (EIA) Ordinance, the Director of Environmental Protection (DEP) granted the Environmental Permit (No. EP- 494/2015) to the Water Supplies Department (WSD) to construct and operate the designated project for "In-situ Reprovisioning of Sha Tin Water Treatment Works South Works" ("The Project").
- 1.2 Upon the requirement of the Environmental Permit, a detailed vegetation report presenting the baseline vegetation condition for flora species with conservation interest, transplanting and monitoring programme for the Project has been prepared and approved by DEP in February 2016.
- 1.3 There were 4 flora species of conservation importance were recorded in the woodland habitat within project site including Ailanthus (*Ailanthus fordii*), Incense Tree (*Aquilaria sinensis*), Lamb of Tartary (*Cibotium barometz*) and Hong Kong Eagle's Claw (*Artabotrys hongkongensis*). In total, 2 nos. of Incense Tree (*Aquilaria sinensis*), 1 no. of Ailanthus (*Ailanthus fordii*) trees, 5 colonies of Lamb of Tartary (*Cibotium barometz*) and 1 no. Hong Kong Eagle's Claw (*Artabotrys hongkongensis*) was recommended to be transplanted in the approved detailed vegetation survey report.
- 1.4 Detailed vegetation report was planned that Incense Tree (*Aquilaria sinensis*) and Ailanthus (*Ailanthus fordii*) trees will be transplanted within existing Sha Tin Water Treatment Works (STWTW). All other shrubs including Lamb of Tartary (*Cibotium barometz*) and Hong Kong Eagle's Claw (*Artabotrys hongkongensis*) will be transplanted to the hillside slope at Sha Tin South Fresh Water Service Reservoir (STSFWSR).
- 1.2 Upon the requirement of the Environmental Permit, a qualified Ecologist was commissioned to prepare a post-transplantation monitoring report to present the status (health condition and survival rate) of transplanted vegetation and submitted to the DEP.
- 1.3 Monitoring of transplanted flora was conducted after the transplantation. The monitoring will be conducted at twice per month during the first year and once per month during the course of planting works. The parameters to be monitoring will include the health condition and survival rate of the transplanted flora. Any observations and recommendations will be reported in monthly EM&A reports.
- 1.3 This is no. 27 Tree Report presents data collected in 04 March 2017. It contains the following information:
 - Introduction (Section 1)
 - Description Of Tree Monitoring Area (Section 2)
 - Monitoring Methodology (Section 3)
 - Result (Section 4)

- Summary
- Photos (Appendix I)
- Summary table (Appendix II)

2. DESCRIPTION OF TREE MONITORING SITE

- 2.1 Incense Tree (*Aquilaria sinensis*) and Ailanthus (*Ailanthus fordii*) trees will be transplanted within existing Sha Tin Water Treatment Works (STWTW) where is the extended compensatory plantation area. The area was flat and without covering with concrete.
- 2.2 Lamb of Tartary (*Cibotium barometz*) and Hong Kong Eagle's Claw (*Artabotrys hongkongensis*) will be transplanted to the Sha Tin South Fresh Water Service Reservoir (STSFWSR) where is currently covered with concrete. Plough is required before planting on to this area.
- 2.3 The planting site at Sha Tin South Fresh Water Service Reservoir (STSFWSR) was still under preparation. Transplanted Lamb of Tartary (*Cibotium barometz*) and Hong Kong Eagle's Claw (*Artabotrys hongkongensis*) will be temporally stored at nursery garden at Wang Toi Shan, Kam Tin. Once the planting site at Sha Tin South Fresh Water Service Reservoir (STSFWSR) was prepared and temporally stored transplanted vegetation were in fair condition, all transplanted Lamb of Tartary (*Cibotium barometz*) and Hong Kong Eagle's Claw (*Artabotrys hongkongensis*) will be planted at the planting site.

3. MONITORING METHODOLOGY

- 3.1 Site inspection will be carried out by walking through the transplanting area. Health condition and survival rate will be observed during inspection.
- 3.4 Health condition of all transplanted vegetation including trees/Shrubs surveyed was evaluated according to the following criteria:
 - Transplanted vegetation with good health are classified as **good**;
 - Transplanted vegetation with few or no visible defects or health problems are classified as being **fair**;
 - Transplanted vegetation were badly damaged or clearly suffering from decay die back or the effects of very heavy vine growth are classified as **poor**.
- 3.5 Survival rate for each of transplanted vegetation species will be calculated based on site observation.

4. RESULT

- 4.1 Monitoring inspection was conducted on 04 March 2017. TA572, TA326 and TA327 tree was transplanted to tree compensation area within the Sha Tin Water Treatment Works (STWTW) in 20 June 2016. The condition of TA572 was observed in fair condition while TA326 and TA327 were in poor condition. Tree crown of TA326 and TA327 was observed thinner than the observation in last observation. Fungi attack (species: *Schizophyllum commune*) was observed on TA572 during current inspection. In addition, cracks were seen on TA572 and TA327 which would be due to sun burnt. Transplanted Lamb of Tartary (*Cibotium barometz*) seems to be received too much sunlight. Leaves of them were observed yellowish in colour.
- 4.2 Since Sha Tin South Fresh Water Service Reservoir (STSFWSR) was still under preparation, Lamb of Tartary and Hong Kong Eagle's Claw was still temporally stored on Nursery garden at Wang Toi Shan, Kam Tin.
- 4.3 In general, all transplanted Lamb of Tartary (*Cibotium barometz*) were in fair condition while Hong Kong Eagle's Claw (*Artabotrys hongkongensis*) was observed dead during inspection on 20 August 2016. The survival rate for Lamb of Tartary (*Cibotium barometz*) and Hong Kong Eagle's Claw (*Artabotrys hongkongensis*) was 96%. The Summary table for health condition and survival rate was shown in Appendix II.
- 4.4 All transplanted Lamb of Tartary (*Cibotium barometz*) were under recovery stage. It is recommended to retain them at the nursery garden under proper maintenance during current recovery stage. Once their condition has recovered to acceptable level, they can be moved to the transplantation site at Sha Tin South Fresh Water Service Reservoir (STSFWSR) in order to increase their transplantation survival rate.
- 4.5 After transplantation, root ball of TA572, TA326 and TA327 tree should be kept moisture especially during non-raining day.

5. MITIGATION MEASURE

Hong Kong Eagle's Claw (*Artabotrys hongkongensis*) was observed dead during inspection on 20 August 2016. In order to compensate for the lost of transplanted Hong Kong Eagle's Claw which is in climber growing form, it is recommended to plant an individual of native climber species at compensatory planting site (Sha Tin South Fresh Water Service Reservoir (STSFWSR)) together with compensatory tree planting. Recommended list of species are given in the table below. It is suggested that about 1 species of climber to be selected from the following list according to availability of the nursery source. The recommended plant species have been recorded from adjacent secondary woodland in an approved EIA Report (AEIAR-187/2015). These species would have certain ecological value in terms of plant ecology and the associated wildlife including birds.

Table for Recommended species list to be planted

Native Tree Species			
Common Name	Latin Name	Chinese name	Growing form
Climbing Bauhinia	Bauhinia glauca	粉葉羊蹄甲	Climber
Spiny-fruited Vine	Byttneria aspera	刺果藤	Climber
Cassytha	Cassytha filiformis	無根藤	Climber
Bentham,s Rose-wood	Dalbergia benthamii	兩廣黃檀	Climber
Desmos	Desmos chinensis	假鷹爪	Climber
Glaucescent Diploclisia	Diploclisia glaucescens	蒼白秤鈎風	Climber
Luofushan Joint-fir	Gnetum luofuense	羅浮買麻藤	Climber
Australian Cow-plant	Gymnema sylvestre	匙羹藤	Climber
Shining Hypserpa	Hypserpa nitida	夜花藤	Climber
Large-floweredHoneysuckle	Lonicera macrantha	大花忍冬	Climber
Splash-of-white	Mussaenda pubescen	玉葉金花	Climber
Rusty-haired Raspberry	Rubus reflexus	鏽毛莓	Climber
Sandpaper Vine	Tetracera asiatica	錫葉藤	Climber
Hong Kong Eagle's Claw	Artabotrys hongkongensis	鷹爪花	Climber

- 5.2 For fungal attack, it is recommended to apply fungicide to control the growth of fungi. 退菌特 and 代森锰锌 was recommended depending on availability from market. Dosage and application method should follow the instruction from package. Before applying fungicide, it is recommended to inform water treatment plant for the approval since the location is closing to fresh water treatment facility.
- 5.3 For sun burnt on TA572 and TA327, it is recommended to wrap a layer of shelter (such as 遮光網) on tree trunk in order to reduce the intensity of sunlight.
- 5.4 For yellowish color for the leave of transplanted Lamb of Tartary (*Cibotium barometz*), it is recommended to provide shelter (such as 遮光網) for them to reduce the intensity of sunlight.

6. SUMMARY

Ailanthus (Ailanthus fordii) and Incense Tree (Aquilaria sinensis) was transplanted to new location within STWTW. The condition of TA572 was observed in fair condition while TA326 and TA327 were in poor condition. Tree crown of TA326 and TA327 was observed thinner than the observation in last observation. Fungi attack (species: Schizophyllum commune) was observed on TA572 during current inspection. Fungicide was recommended to control the growth of fungal attack. In addition, it is recommended to wrap a layer of shelter (such as 遊光網) on tree trunk for TA572 and TA327 in order to reduce the intensity of sunlight. Transplanted Lamb of Tartary (Cibotium barometz) seems to be received too much sunlight. Leaves of them were observed yellowish in colour. Shelter (遊光網) was recommended to reduce the intensity of sunlight. Hong Kong Eagle's Claw was observed dead during

inspection on 20 August 2016. New fronds of transplanted Lamb of Tartary were observed growing out. Lamb of Tartary was under recovery after transplantation. Currently, Lamb of Tartary were temporally stored on Nursery garden at Wang Toi Shan, Kam Tin. It is recommended to retain them at the nursery garden under proper maintenance during current recovery stage.

- 6.2 In general, all transplanted Lamb of Tartary were in fair condition while Hong Kong Eagle's Claw (*Artabotrys hongkongensis*) was observed dead during inspection on 20 August 2016 and the survival rate was 96%.
- 6.3 In order to compensate for the lost of transplanted Hong Kong Eagle's Claw, it is recommended to plant an individual of native climber species at compensatory planting site (Sha Tin South Fresh Water Service Reservoir (STSFWSR)) together with compensatory tree planting. The suggested species in planting list would have certain ecological value in terms of plant ecology and the associated wildlife including birds.
- After transplantation, root ball of TA572, TA326 and TA327 tree should be kept moisture especially during dry and non-raining day.

APPENDIX I Photo

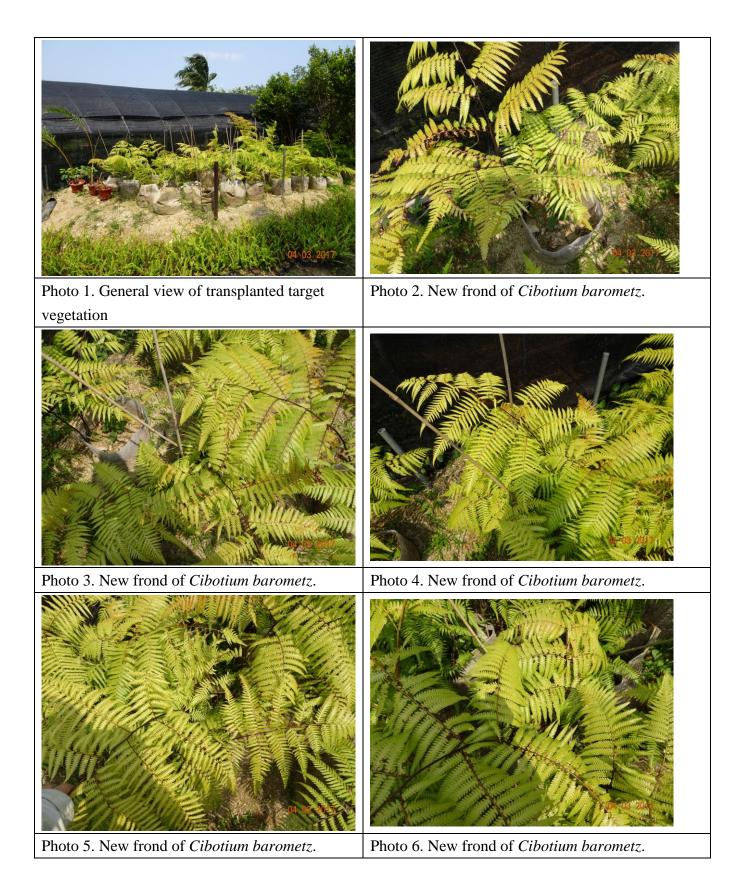






Photo 7. New frond of *Cibotium barometz*.

Photo 8. New frond of Cibotium barometz.



Photo 9. Incense Tree after transplantation (*Aquilaria sinensis*) – TA326 (left) and TA327 (middle), (*Ailanthus fordii*) – TA572 (right)

IN-SITU REPROVISIONING OF SHA TIN WATER TREATMENT WORKS -	- SOUTH WORKS-Post-Transplantation Monitoring Re	nort

APPENDIX II

Table for condition of transplanted plant

Shrubs of Lamb of Tartary and Hong Kong Eagle's Claw

No.	Species	Condition	Alive/Dead	Remark
1	Cibotium barometz	Fair	Alive	Under recovering
2	Cibotium barometz	Fair	Alive	Under recovering
3	Cibotium barometz	Fair	Alive	Under recovering
4	Cibotium barometz	Fair	Alive	Under recovering
5	Cibotium barometz	Fair	Alive	Under recovering
6	Cibotium barometz	Fair	Alive	Under recovering
7	Cibotium barometz	Fair	Alive	Under recovering
8	Cibotium barometz	Fair	Alive	Under recovering
9	Cibotium barometz	Fair	Alive	Under recovering
10	Cibotium barometz	Fair	Alive	Under recovering
11	Cibotium barometz	Fair	Alive	Under recovering
12	Cibotium barometz	Fair	Alive	Under recovering
13	Cibotium barometz	Fair	Alive	Under recovering
14	Cibotium barometz	Fair	Alive	Under recovering
15	Cibotium barometz	Fair	Alive	Under recovering
16	Cibotium barometz	Fair	Alive	Under recovering
17	Cibotium barometz	Fair	Alive	Under recovering
18	Cibotium barometz	Fair	Alive	Under recovering
19	Cibotium barometz	Fair	Alive	Under recovering
20	Cibotium barometz	Fair	Alive	Under recovering
21	Cibotium barometz	Fair	Alive	Under recovering
22	Cibotium barometz	Fair	Alive	Under recovering
23	Cibotium barometz	Fair	Alive	Under recovering
24	Cibotium barometz	Fair	Alive	Under recovering
25	Cibotium barometz	Fair	Alive	Under recovering
26	Cibotium barometz	Fair	Alive	Under recovering
27	Cibotium barometz	Fair	Alive	Under recovering
28	Artabotrys hongkongensis		Dead	
		Survival rate (%)	96%	

Trees of Ailanthus and Incense Tree

No.	Species	Condition	Alive/Dead	Remark
TA572	Ailanthus fordii	Poor to Fair	Alive	Sign of sun burnt. Fungal
				attack was observed.
TA327	Aquilaria sinensis	Poor	Alive	Sign of sun burnt. Tree
				crown of TA327 was
				thinner after
				transplantation.
TA326	Aquilaria sinensis	Poor	Alive	Tree crown of TA326
				was thinner after
				transplantation.
		Survival rate (%)	100%	

Post-Transplantation Monitoring Report

for Agreement No. CE 13/2009 (WS)

IN-SITU REPROVISIONING OF SHA TIN WATER TREATMENT WORKS – SOUTH WORKS

Report No.28

18 March 2017

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3.	MONITORING METHODOLOGY	3
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4.	RESULT	3
5	SUMMARY	4

APPENDICES

APPENDIX I- Photos

APPENDIX II- Table for condition of transplanted plant

1. INTRODUCTION

- 1.1 Pursuant to the Environmental Impact Assessment (EIA) Ordinance, the Director of Environmental Protection (DEP) granted the Environmental Permit (No. EP- 494/2015) to the Water Supplies Department (WSD) to construct and operate the designated project for "In-situ Reprovisioning of Sha Tin Water Treatment Works South Works" ("The Project").
- 1.2 Upon the requirement of the Environmental Permit, a detailed vegetation report presenting the baseline vegetation condition for flora species with conservation interest, transplanting and monitoring programme for the Project has been prepared and approved by DEP in February 2016.
- 1.3 There were 4 flora species of conservation importance were recorded in the woodland habitat within project site including Ailanthus (*Ailanthus fordii*), Incense Tree (*Aquilaria sinensis*), Lamb of Tartary (*Cibotium barometz*) and Hong Kong Eagle's Claw (*Artabotrys hongkongensis*). In total, 2 nos. of Incense Tree (*Aquilaria sinensis*), 1 no. of Ailanthus (*Ailanthus fordii*) trees, 5 colonies of Lamb of Tartary (*Cibotium barometz*) and 1 no. Hong Kong Eagle's Claw (*Artabotrys hongkongensis*) was recommended to be transplanted in the approved detailed vegetation survey report.
- 1.4 Detailed vegetation report was planned that Incense Tree (*Aquilaria sinensis*) and Ailanthus (*Ailanthus fordii*) trees will be transplanted within existing Sha Tin Water Treatment Works (STWTW). All other shrubs including Lamb of Tartary (*Cibotium barometz*) and Hong Kong Eagle's Claw (*Artabotrys hongkongensis*) will be transplanted to the hillside slope at Sha Tin South Fresh Water Service Reservoir (STSFWSR).
- 1.2 Upon the requirement of the Environmental Permit, a qualified Ecologist was commissioned to prepare a post-transplantation monitoring report to present the status (health condition and survival rate) of transplanted vegetation and submitted to the DEP.
- 1.3 Monitoring of transplanted flora was conducted after the transplantation. The monitoring will be conducted at twice per month during the first year and once per month during the course of planting works. The parameters to be monitoring will include the health condition and survival rate of the transplanted flora. Any observations and recommendations will be reported in monthly EM&A reports.
- 1.3 This is no. 28 Tree Report presents data collected in 18 March 2017. It contains the following information:
 - Introduction (Section 1)
 - Description Of Tree Monitoring Area (Section 2)
 - Monitoring Methodology (Section 3)
 - Result (Section 4)

- Summary
- Photos (Appendix I)
- Summary table (Appendix II)

2. DESCRIPTION OF TREE MONITORING SITE

- 2.1 Incense Tree (*Aquilaria sinensis*) and Ailanthus (*Ailanthus fordii*) trees will be transplanted within existing Sha Tin Water Treatment Works (STWTW) where is the extended compensatory plantation area. The area was flat and without covering with concrete.
- 2.2 Lamb of Tartary (*Cibotium barometz*) and Hong Kong Eagle's Claw (*Artabotrys hongkongensis*) will be transplanted to the Sha Tin South Fresh Water Service Reservoir (STSFWSR) where is currently covered with concrete. Plough is required before planting on to this area.
- 2.3 The planting site at Sha Tin South Fresh Water Service Reservoir (STSFWSR) was still under preparation. Transplanted Lamb of Tartary (*Cibotium barometz*) and Hong Kong Eagle's Claw (*Artabotrys hongkongensis*) will be temporally stored at nursery garden at Wang Toi Shan, Kam Tin. Once the planting site at Sha Tin South Fresh Water Service Reservoir (STSFWSR) was prepared and temporally stored transplanted vegetation were in fair condition, all transplanted Lamb of Tartary (*Cibotium barometz*) and Hong Kong Eagle's Claw (*Artabotrys hongkongensis*) will be planted at the planting site.

3. MONITORING METHODOLOGY

- 3.1 Site inspection will be carried out by walking through the transplanting area. Health condition and survival rate will be observed during inspection.
- 3.4 Health condition of all transplanted vegetation including trees/Shrubs surveyed was evaluated according to the following criteria:
 - Transplanted vegetation with good health are classified as **good**;
 - Transplanted vegetation with few or no visible defects or health problems are classified as being **fair**;
 - Transplanted vegetation were badly damaged or clearly suffering from decay die back or the effects of very heavy vine growth are classified as **poor**.
- 3.5 Survival rate for each of transplanted vegetation species will be calculated based on site observation.

4. RESULT

- 4.1 Monitoring inspection was conducted on 18 March 2017. TA572, TA326 and TA327 tree was transplanted to tree compensation area within the Sha Tin Water Treatment Works (STWTW) in 20 June 2016. The condition of TA572 was observed in fair condition while TA326 and TA327 were in poor condition. Tree crown of TA326 and TA327 was observed thinner than the observation in last observation. Fungi attack (species: *Schizophyllum commune*) was observed on TA572 during current inspection. In addition, cracks were seen on TA572 and TA327 which would be due to sun burnt. Transplanted Lamb of Tartary (*Cibotium barometz*) seems to be received too much sunlight. Leaves of them were observed yellowish in colour.
- 4.2 Since Sha Tin South Fresh Water Service Reservoir (STSFWSR) was still under preparation, Lamb of Tartary and Hong Kong Eagle's Claw was still temporally stored on Nursery garden at Wang Toi Shan, Kam Tin.
- 4.3 In general, all transplanted Lamb of Tartary (*Cibotium barometz*) were in fair condition while Hong Kong Eagle's Claw (*Artabotrys hongkongensis*) was observed dead during inspection on 20 August 2016. The survival rate for Lamb of Tartary (*Cibotium barometz*) and Hong Kong Eagle's Claw (*Artabotrys hongkongensis*) was 96%. The Summary table for health condition and survival rate was shown in Appendix II.
- 4.4 All transplanted Lamb of Tartary (*Cibotium barometz*) were under recovery stage. It is recommended to retain them at the nursery garden under proper maintenance during current recovery stage. Once their condition has recovered to acceptable level, they can be moved to the transplantation site at Sha Tin South Fresh Water Service Reservoir (STSFWSR) in order to increase their transplantation survival rate.
- 4.5 After transplantation, root ball of TA572, TA326 and TA327 tree should be kept moisture especially during non-raining day.

5. MITIGATION MEASURE

Hong Kong Eagle's Claw (*Artabotrys hongkongensis*) was observed dead during inspection on 20 August 2016. In order to compensate for the lost of transplanted Hong Kong Eagle's Claw which is in climber growing form, it is recommended to plant an individual of native climber species at compensatory planting site (Sha Tin South Fresh Water Service Reservoir (STSFWSR)) together with compensatory tree planting. Recommended list of species are given in the table below. It is suggested that about 1 species of climber to be selected from the following list according to availability of the nursery source. The recommended plant species have been recorded from adjacent secondary woodland in an approved EIA Report (AEIAR-187/2015). These species would have certain ecological value in terms of plant ecology and the associated wildlife including birds.

Table for Recommended species list to be planted

Native Tree Species			
Common Name	Latin Name	Chinese name	Growing form
Climbing Bauhinia	Bauhinia glauca	粉葉羊蹄甲	Climber
Spiny-fruited Vine	Byttneria aspera	刺果藤	Climber
Cassytha	Cassytha filiformis	無根藤	Climber
Bentham,s Rose-wood	Dalbergia benthamii	兩廣黃檀	Climber
Desmos	Desmos chinensis	假鷹爪	Climber
Glaucescent Diploclisia	Diploclisia glaucescens	蒼白秤鈎風	Climber
Luofushan Joint-fir	Gnetum luofuense	羅浮買麻藤	Climber
Australian Cow-plant	Gymnema sylvestre	匙羹藤	Climber
Shining Hypserpa	Hypserpa nitida	夜花藤	Climber
Large-floweredHoneysuckle	Lonicera macrantha	大花忍冬	Climber
Splash-of-white	Mussaenda pubescen	玉葉金花	Climber
Rusty-haired Raspberry	Rubus reflexus	鏽毛莓	Climber
Sandpaper Vine	Tetracera asiatica	錫葉藤	Climber
Hong Kong Eagle's Claw	Artabotrys hongkongensis	鷹爪花	Climber

- 5.2 For fungal attack, it is recommended to apply fungicide to control the growth of fungi. Bactericide (退 菌特) and Mancozeb (代森锰锌) was recommended depending on availability from market. Dosage and application method should follow the instruction from package. Before applying fungicide, it is recommended to inform water treatment plant for the approval since the location is closing to fresh water treatment facility.
- 5.3 For sun burnt on TA572 and TA327, it is recommended to wrap a layer of shelter (such as 遮光網) on tree trunk in order to reduce the intensity of sunlight.
- 5.4 For yellowish color for the leave of transplanted Lamb of Tartary (*Cibotium barometz*), it is recommended to provide shelter (such as 遮光網) for them to reduce the intensity of sunlight.

6. SUMMARY

Ailanthus (Ailanthus fordii) and Incense Tree (Aquilaria sinensis) was transplanted to new location within STWTW. The condition of TA572 was observed in fair condition while TA326 and TA327 were in poor condition. Tree crown of TA326 and TA327 was observed thinner than the observation in last observation. Fungi attack (species: Schizophyllum commune) was observed on TA572 during current inspection. Fungicide was recommended to control the growth of fungal attack. In addition, it is recommended to wrap a layer of shelter (such as 遮光網) on tree trunk for TA572 and TA327 in order to reduce the intensity of sunlight. Transplanted Lamb of Tartary (Cibotium barometz) seems to be received too much sunlight. Leaves of them were observed yellowish in colour. Shelter (遮光網) was recommended to

reduce the intensity of sunlight. Hong Kong Eagle's Claw was observed dead during inspection on 20 August 2016. New fronds of transplanted Lamb of Tartary were observed growing out. Lamb of Tartary was under recovery after transplantation. Currently, Lamb of Tartary were temporally stored on Nursery garden at Wang Toi Shan, Kam Tin. It is recommended to retain them at the nursery garden under proper maintenance during current recovery stage.

- 6.2 In general, all transplanted Lamb of Tartary were in fair condition while Hong Kong Eagle's Claw (*Artabotrys hongkongensis*) was observed dead during inspection on 20 August 2016 and the survival rate was 96%.
- 6.3 In order to compensate for the lost of transplanted Hong Kong Eagle's Claw, it is recommended to plant an individual of native climber species at compensatory planting site (Sha Tin South Fresh Water Service Reservoir (STSFWSR)) together with compensatory tree planting. The suggested species in planting list would have certain ecological value in terms of plant ecology and the associated wildlife including birds.
- 6.4 After transplantation, root ball of TA572, TA326 and TA327 tree should be kept moisture especially during dry and non-raining day.

APPENDIX I Photo

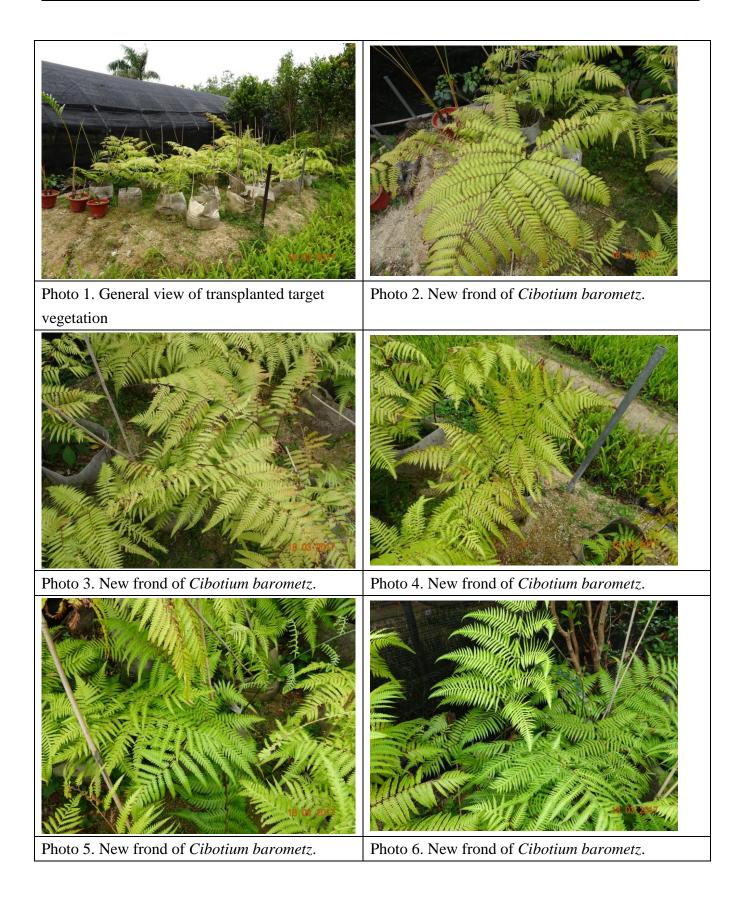






Photo 7. New frond of Cibotium barometz.

Photo 8. New frond of Cibotium barometz.



Photo 9. Incense Tree after transplantation (*Aquilaria sinensis*) – TA326 (left) and TA327 (middle), (*Ailanthus fordii*) – TA572 (right)

IN-SITU REPROVISIONING OF SHA TIN WATER TREATMENT WORKS -	_ SOUTH WORKS_Post-Transplantation Monitoring 1	Report
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APPENDIX II

Table for condition of transplanted plant

Shrubs of Lamb of Tartary and Hong Kong Eagle's Claw

No.	Species	Condition	Alive/Dead	Remark
1	Cibotium barometz	Fair	Alive	Under recovering
2	Cibotium barometz	Fair	Alive	Under recovering
3	Cibotium barometz	Fair	Alive	Under recovering
4	Cibotium barometz	Fair	Alive	Under recovering
5	Cibotium barometz	Fair	Alive	Under recovering
6	Cibotium barometz	Fair	Alive	Under recovering
7	Cibotium barometz	Fair	Alive	Under recovering
8	Cibotium barometz	Fair	Alive	Under recovering
9	Cibotium barometz	Fair	Alive	Under recovering
10	Cibotium barometz	Fair	Alive	Under recovering
11	Cibotium barometz	Fair	Alive	Under recovering
12	Cibotium barometz	Fair	Alive	Under recovering
13	Cibotium barometz	Fair	Alive	Under recovering
14	Cibotium barometz	Fair	Alive	Under recovering
15	Cibotium barometz	Fair	Alive	Under recovering
16	Cibotium barometz	Fair	Alive	Under recovering
17	Cibotium barometz	Fair	Alive	Under recovering
18	Cibotium barometz	Fair	Alive	Under recovering
19	Cibotium barometz	Fair	Alive	Under recovering
20	Cibotium barometz	Fair	Alive	Under recovering
21	Cibotium barometz	Fair	Alive	Under recovering
22	Cibotium barometz	Fair	Alive	Under recovering
23	Cibotium barometz	Fair	Alive	Under recovering
24	Cibotium barometz	Fair	Alive	Under recovering
25	Cibotium barometz	Fair	Alive	Under recovering
26	Cibotium barometz	Fair	Alive	Under recovering
27	Cibotium barometz	Fair	Alive	Under recovering
28	Artabotrys hongkongensis		Dead	
		Survival rate (%)	96%	

Trees of Ailanthus and Incense Tree

No.	Species	Condition	Alive/Dead	Remark
TA572	Ailanthus fordii	Poor to Fair	Alive	Sign of sun burnt. Fungal
				attack was observed.
TA327	Aquilaria sinensis	Poor	Alive	Sign of sun burnt. Tree
				crown of TA327 was
				thinner after
				transplantation.
TA326	Aquilaria sinensis	Poor	Alive	Tree crown of TA326
				was thinner after
				transplantation.
		Survival rate (%)	100%	

Appendix T Monthly Summary of Waste Flow Table

Water Supplies Department

Monthly Summary Waste Flow Table

for Contract with Environmental Management Plan under ETWB TCW No. 19/2005 and its Interim Guidance Note Reporting Year: 2017

Contract No. 3/WSD/15

(To be submitted to C&D MM Coordinator of Respective Division/Region via Engineer's Representative before 15th of the following month)

	Act	ual Quantities of Ine	ert C&D Materials	Generated / Import	ed (in '000 m ³)		A	ctual Quantities of C	Other C&D Materia	ls / Wastes Genera	ted
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	Plastic (bottles/containers, plastic sheets/ foams from package material)	Chemical Waste	Others (e.g. General Refuse etc.)
	[a+b+c+d)	(a)	(b)	(c)	(d)		(in '000kg)	(in '000kg)	(in '000kg)	(in '000kg)	(in '000m ³)
January	3.062	0.000	0.217	2.592	0.254	0.000	4.086	0.001	0.003	0.000	0.007
February	5.222	0.000	0.072	4.566	0.584	0.000	0.000	0.000	0.000	0.000	0.005
March	10.282	0.000	0.020	6.092*	4.170	0.000	4.155	0.075	0.002	0.000	0.041
April	0.000										
May	0.000										
June	0.000										
Half-year total	18.567	0.000	0.309	7.158	5.008	0.000	8.241	0.076	0.005	0.000	0.053
July	0.000										
August	0.000										
September	0.000										
October	0.000										
November	0.000										
December	0.000										
Yearly Total	18.567	0.000	0.309	7.158	5.008	0.000	8.241	0.076	0.005	0.000	0.053

^{* 6,092} m3 was reused in CV/2015/03 (Site formation and infrastructural works near Tong Hang Road and Tsz Tin Road in Area 54, Tuen Mun)

Appendix U Implementation Schedule of Environmental Mitigation Measures (EMIS)

Environmental Mitigation and Enhancement Measure Implementation Schedule at Construction Stage

EIA Ref.	Recommended Mitigation Measures	Location of the	Implementation	Relevant Legislation	Impl	ement Phase		Status
		Measures	Agent	and Guidelines	D	С	0	
Air Quality					1			
4.7.1	Use of regular watering to reduce dust emissions from exposed site surfaces and unpaved roads, particularly during dry weather.	All works areas	Contractor	Air Pollution Control		V		Υ
4.7.1	Side enclosure and covering of any aggregate or stockpiling of dusty material to reduce emissions. Where this is not practicable owing to frequent usage, watering shall be applied to aggregate fines.	All works areas	Contractor	Ordinance and Air Pollution Control (Construction		V		Υ
4.7.1	Tarpaulin covering of all dusty vehicle loads transported to, from and between site locations.	All works areas	Contractor	Dust) Regulation EM&A Manual		√		Υ
4.7.1	Establishment and use of vehicle wheel and body washing facilities at the exit points of the site.	All works areas	Contractor	- EIVIQA Manuai		1		Υ
4.7.1	Imposition of speed controls for vehicles on site haul roads.	All works areas	Contractor			V		Υ
4.7.1	Implement EM&A program to monitor the construction process in order to enforce controls and modify method of work if dusty conditions arise.	All works areas / Monitoring points	Contractor			V		Υ
Noise		P =	l.	I.	1	1		I
5.6.4	Implement good site practices to reduce noise level	All works areas	Contractor	Noise Control Ordinance		1		Υ
5.6.5	Adoption of Quiet PME	All works areas	Contractor			1		N/A
5.6.6	Use of Movable Noise Barrier	All works areas	Contractor			1		N/A
5.8	Noise monitoring	Monitoring points	Contractor			√		Υ
Water Quality								
6.8.1	Surface run-off from construction sites should be discharged into storm drains via adequately designed sand/silt removal facilities such as sand	All works areas	Contractor	ProPECC PN 1/94 Construction		1		Υ

the deposited silt and grit should be removed regularly, at the onset of and after each rainstorm to prevent local flooding. Temporary exposed slope surfaces should be covered and temporary access roads should be protected by crushed stone or gravel, as excavation proceeds. Intercepting channels should be provided to prevent storm run-off from washing across exposed soil surfaces. 8.8.4 Earthworks final surfaces should be well compacted and the subsequent permanent work or surface protection should be carried out immediately after the final surfaces are formed to prevent erosion caused by rainstorms. Appropriate drainage like intercepting channels should be provided where necessary. 8.8.5 Rainwater pumped out from trenches or foundation excavations should be discharged into storm drains via silt removal facilities. 9 All works areas Contractor All works areas Contractor All works areas Contractor acquately and acquately provided and plant should be adopted to remove rubbish and litter from spreading from the site area. All works areas Contractor All works areas Contractor All works areas Contractor			T	1			1	- 1
Silt removal facilities, channels and manholes should be maintained and the deposited silt and grit should be removed regularly, at the onset of and after each rainstorm to prevent local flooding. S.8.3 Temporary exposed slope surfaces should be covered and temporary access roads should be protected by crushed stone or gravel, as excavation proceeds. Intercepting channels should be provided to prevent storm run-off from washing across exposed soil surfaces. S.8.4 Earthworks final surfaces should be well compacted and the subsequent partner work or surface protection should be carried out immediately after the final surfaces are formed to prevent erosion caused by rainstorms. Appropriate drainage like intercepting channels should be provided where necessary. S.8.5 Rainwater pumped out from trenches or foundation excavations should be provided where necessary. S.8.6 Open stockpiles of construction materials (e.g. aggregates, sand and fill material) on sites should be covered with tarpaulin or similar fabric during rainstorms. S.8.7 Manholes (including newly constructed ones) should always be adequately covered and temporarily sealed so as to prevent silt, construction materials or debris from getting into the drainage system. S.8.8 Good site practices should be adopted to remove rubbish and litter from construction materials or debris from getting into the drainage system. S.8.9 All vehicles and plant should be cleaned before they leave a construction site to minimize the deposition of earth, mud, debris on roads. A wheel washing bay should be provided at every site exit if practicable and wash-water should have sand and silt settled out or removed before discharging into storm drains. S.8.10 Before commencing any demolition works, all drainage connections. All works areas Contractor		sand bag barriers should be provided on site to properly direct stormwater to such silt removal facilities. Perimeter channels at site boundaries should be provided where necessary to intercept storm run-off from outside the site so that it will not wash across the site. Catchpits and perimeter channels should be constructed in advance of			TM-DSS Water Pollution Control			
Temporary exposed slope surfaces should be covered and temporary access roads should be protected by crushed stone or gravel, as excavation proceeds. Intercepting channels should be provided to prevent storm run-off from washing across exposed soil surfaces. Earthworks final surfaces should be well compacted and the subsequent permanent work or surface protection should be carried out immediately after the final surfaces are formed to prevent erosion caused by rainstorms. Appropriate drainage like intercepting channels should be provided where necessary. S.8.5 Rainwater pumped out from trenches or foundation excavations should be discharged into storm drains via silt removal facilities. S.8.6 Open stockpiles of construction materials (e.g. aggregates, sand and fill works areas) S.8.7 Manholes (including newly constructed ones) should always be adequately covered and temporarily sealed so as to prevent silt, construction materials or debris from getting into the drainage system. S.8.8 Good site practices should be adopted to remove rubbish and litter from construction sites so as to prevent the rubbish and litter from construction sites so as to prevent the rubbish and litter from site to minimize the deposition of earth, mud, debris on roads. A wheel washing bay should be provided at every site exit if practicable and wash-water should have sand and silt settled out or removed before discharging into storm drains. S.8.10 Before commencing any demolition works, all drainage connections All works areas Contractor	6.8.2	Silt removal facilities, channels and manholes should be maintained and the deposited silt and grit should be removed regularly, at the onset of	All works areas	Contractor		√		Υ
permanent work or surface protection should be carried out immediately after the final surfaces are formed to prevent erosion caused by rainstorms. Appropriate drainage like intercepting channels should be provided where necessary. 8.8.5 Rainwater pumped out from trenches or foundation excavations should be discharged into storm drains via silt removal facilities. 8.8.6 Open stockpiles of construction materials (e.g. aggregates, sand and fill material) on sites should be covered with tarpaulin or similar fabric during rainstorms. 8.8.7 Manholes (including newly constructed ones) should always be adequately covered and temporarily sealed so as to prevent silt, construction materials or debris from getting into the drainage system. 8.8.8 Good site practices should be adopted to remove rubbish and litter from construction sites so as to prevent the rubbish and litter from spreading from the site area. 8.8.9 All vehicles and plant should be cleaned before they leave a construction site to minimize the deposition of earth, mud, debris on roads. A wheel washing bay should be provided at every site exit if practicable and wash-water should have sand and silt settled out or removed before discharging into storm drains. 8.8.10 Before commencing any demolition works, all drainage connections All works areas Contractor	6.8.3	Temporary exposed slope surfaces should be covered and temporary access roads should be protected by crushed stone or gravel, as excavation proceeds. Intercepting channels should be provided to	All works area	Contractor		√		Υ
Rainwater pumped out from trenches or foundation excavations should be discharged into storm drains via silt removal facilities. Open stockpiles of construction materials (e.g. aggregates, sand and fill material) on sites should be covered with tarpaulin or similar fabric during rainstorms. All works areas Contractor	6.8.4	permanent work or surface protection should be carried out immediately after the final surfaces are formed to prevent erosion caused by rainstorms. Appropriate drainage like intercepting channels should be	All works areas	Contractor		V		N/A
material) on sites should be covered with tarpaulin or similar fabric during rainstorms. 5.8.7 Manholes (including newly constructed ones) should always be adequately covered and temporarily sealed so as to prevent silt, construction materials or debris from getting into the drainage system. 6.8.8 Good site practices should be adopted to remove rubbish and litter from construction sites so as to prevent the rubbish and litter from spreading from the site area. 6.8.9 All vehicles and plant should be cleaned before they leave a construction site to minimize the deposition of earth, mud, debris on roads. A wheel washing bay should be provided at every site exit if practicable and wash-water should have sand and silt settled out or removed before discharging into storm drains. 6.8.10 Before commencing any demolition works, all drainage connections All works areas Contractor	6.8.5	Rainwater pumped out from trenches or foundation excavations should	All works areas	Contractor		√		Υ
adequately covered and temporarily sealed so as to prevent silt, construction materials or debris from getting into the drainage system. 5.8.8 Good site practices should be adopted to remove rubbish and litter from construction sites so as to prevent the rubbish and litter from spreading from the site area. 6.8.9 All vehicles and plant should be cleaned before they leave a construction site to minimize the deposition of earth, mud, debris on roads. A wheel washing bay should be provided at every site exit if practicable and wash-water should have sand and silt settled out or removed before discharging into storm drains. 6.8.10 Before commencing any demolition works, all drainage connections All works areas Contractor	6.8.6	material) on sites should be covered with tarpaulin or similar fabric	All works areas	Contractor		V		Υ
construction sites so as to prevent the rubbish and litter from spreading from the site area. 5.8.9 All vehicles and plant should be cleaned before they leave a construction site to minimize the deposition of earth, mud, debris on roads. A wheel washing bay should be provided at every site exit if practicable and wash-water should have sand and silt settled out or removed before discharging into storm drains. 5.8.10 Before commencing any demolition works, all drainage connections All works areas Contractor	6.8.7	adequately covered and temporarily sealed so as to prevent silt,	All works areas	Contractor		√		Υ
site to minimize the deposition of earth, mud, debris on roads. A wheel washing bay should be provided at every site exit if practicable and wash-water should have sand and silt settled out or removed before discharging into storm drains. 5.8.10 Before commencing any demolition works, all drainage connections All works areas Contractor	6.8.8	construction sites so as to prevent the rubbish and litter from spreading	All works areas	Contractor		√		Υ
5.8.10 Before commencing any demolition works, all drainage connections All works areas Contractor	6.8.9	site to minimize the deposition of earth, mud, debris on roads. A wheel washing bay should be provided at every site exit if practicable and wash-water should have sand and silt settled out or removed before	All works areas	Contractor		V		Υ
	6.8.10		All works areas	Contractor		√		N/A

	drains.					
6.8.11	Wastewater generated from building construction activities including concreting, plastering, internal decoration, cleaning of works and similar activities should not be discharged into the stormwater drainage system. If the wastewater is to be tankered off site for disposal into foul sewers, it should undergo the removal of settleable solids in a silt removal facility, and pH adjustment as necessary.	All works areas	Contractor		√	Υ
5.8.12	Acidic wastewater generated from acid cleaning, etching, pickling and similar activities should be neutralized to within the pH range of 6 to 10. The neutralized wastewater should be tankered off site for disposal into foul sewers or treated to a standard acceptable to storm drains and the receiving waters.	All works areas	Contractor		√	N/
6.8.13	All surface run-off must proper collected and discharge at designated location. The discharge quality must meet the requirements specified in the discharge license.	All works areas	Contractor		√	Υ
6.8.15	Contractor must register as a chemical waste producer if chemical wastes would be produced from the construction activities. The Waste Disposal Ordinance (Cap 354) and its subsidiary regulations in particular the Waste Disposal (Chemical Waste) (General) Regulation should be observed and complied with for control of chemical wastes.	All works areas	Contractor		V	Υ
6.8.16	Maintenance of vehicles and equipment involving activities with potential for leakage and spillage should only be undertaken within the areas appropriately equipped to control these discharges	All works areas	Contractor		√	Υ
6.8.17	Disposal of chemical wastes should be carried out in compliance with the Waste Disposal Ordinance.	All works areas	Contractor		√	Υ
6.8.18	Sewage generated from the workforce should be properly treated by interim treatment facilities, such as chemical toilets which are properly maintained with the employment of licensed collectors for the collection and disposal on a regular basis.	All works areas	Contractor		V	Y
6.8.19	Adopt relevant measures stated in ETWB TC (Works) No. 5/2005 "Protection of Natural Streams/rivers from Adverse Impacts arising from Construction Works" to minimize the potential water quality impacts from the construction works near any water courses.	All works areas	Contractor		√	Y
6.10	Water quality monitoring	Monitoring points	Contractor		√	Υ

7.6.1	Appropriate waste handling, transportation and disposal methods for all waste arisings generated during the construction works for the Project should be implemented to ensure that construction wastes do not enter the nearby streams or drainage channel.	All works areas	Contractor	Waste Disposal Ordinance DEVB TCW No.	√	Υ
7.6.2	Implementation of good site practices for waste management	All works areas	Contractor	6/2010,	√	Υ
7.6.3	Implementation of trip ticket system to control waste disposal	All works areas	Contractor	ETWB TCW No.	√	Υ
7.6.4	Implementation of good site practices to reduce waste generations	All works areas	Contractor	19/2005 Land	√	Υ
7.6.5	Re-use of excavated C&D materials on site as far as practical. A suitable area should be designated within the site for temporary stockpiling of C&D material and to facilitate the sorting process.	All works areas	Contractor	(Miscellaneous Provisions) Ordinance	√	Υ
7.6.8	General refuse should be stored in enclosed bins or compaction units separate from C&D material. A reputable waste collector should be employed by the contractor to remove general refuse from the site, separately from C&D material.	All works areas	Contractor	Code of Practice on the Packaging, Labelling and	√	Υ
7.6.9	All storage of asbestos waste should be carried out properly in a secure place isolated from other substances so as to prevent any possible release of asbestos fibres into the atmosphere and contamination of other substances. The storage area should bear warning panels to alert people of the presence of asbestos waste.	All works areas	Contractor	Storage of Chemical Wastes	V	N/A
7.6.10	A licensed asbestos waste collector will be appointed to collect the asbestos waste and deliver to the designated landfill for disposal. Application should be submitted to EPD.	All works areas	Contractor		√	N/A
7.6.11	If chemical wastes were to be produced at the construction site, the Contractor would be required to register with the EPD as a Chemical Waste Producer, and to follow the guidelines stated in the Code of Practice on the Packaging, Labelling and Storage of Chemical Wastes. Good quality containers compatible with the chemical wastes should be used, and incompatible chemicals should be stored separately. Appropriate labels should be securely attached on each chemical waste container indicating the corresponding chemical characteristics of the waste, such as explosive, flammable, oxidizing, irritant, toxic, harmful, corrosive, etc. The Contractor shall use a licensed collector to transport the chemical wastes. The licensed collector shall deliver the waste to the Chemical Waste Treatment Centre at Tsing Yi, or other licenced facility, in accordance with	All works areas	Contractor		V	Y

	the Waste Disposal (Chemical Waste) (General) Regulation.					
Ecology	1		I			
8.8.1	Ecological impacts on important habitats and the associated wildfile caused by the proposed development should be mitigated and compensation approaches to the maximum practical extent	All works areas in particular important	The Engineer/ Contractor	EIAO-TM EM&A Manual	V	Υ
8.8.2	Reduce the amount of vegetation removal required and thereby minimize the footprint of the slope at the woodland habitat	habitats All works areas	The Engineer/ Contractor		√	Υ
8.8.3	Conduct detailed vegetation survey and implement suggested measures for species of conservation importance.		The Engineer/ Contractor		√	Υ
8.8.4	The affected Incense Tree and Ailanthus as mentioned in the detailed vegetation survey report within the works area will be transplanted		The Engineer/ Contractor		V	Υ
8.8.5	To avoid impacts on Short-nosed Fruit Bat, the tree with records of an active roost and trees showing evidence of roosting activity should be retained where possible. Where Chinese Fan-palm (Livistona chinensis) removal is required, these should be checked by suitably qualified ecologist with over 7 years relevant experience for roosting bats prior to their removal. If roosting bats are observed, a strategy for passive removal will be agreed with the AFCD and implemented. This could include undertaking the works just after the bats have left the roost (i.e. dusk).		The Engineer/ Contractor		√	N/A
8.8.6	The inclusion of Chinese Fan-palm of similar size as the affected plant within the areas of compensatory planting or other suitable areas is recommended to replace affected specimens, and compensate for the impact to roosting opportunities for this bat species		The Engineer/ Contractor		√	N/A
8.8.7	Implement good site measures to minimize the disturbance impacts to terrestrial habitat and associated wildlife arising from the land-based construction activities.		The Engineer/ Contractor		V	Υ
8.8.8	To minimize the contamination of wastewater discharge, accidental chemical spillage and construction site run-off to the receiving water bodies, mitigation measures such as diverting the site runoff to silt trap facilities before discharging into storm drain, proper waste and dumping management and standard good site practice for land-based construction.		The Engineer/ Contractor		V	Υ
8.8.9-8.8.11	Implement woodland compensation		The Engineer/ Contractor		V	N/A

Landscape and 9.8.1	Existing tress to be retained on site shall be carefully protected during	All works areas	Contractor	DEVB TCW No.		
7.0.1	construction. Trees unavoidably affected by the works shall be transplanted as far as possible.	All Works areas	Contractor	10/2013	$\sqrt{}$	Y
	Compensatory Planting shall be provided in accordance with DEVB TCW No. 10/2013 – Tree Preservation.	All works areas	Contractor	EIAO TM	V	Υ
	Control of night-time lighting glare.	All works areas	Contractor		V	Υ
	Erection of decorative screen hoarding compatible with the surrounding setting.	All works areas	Contractor		V	Y
	Management of facilities on work sites which give control on the height and disposition/arrangement of all facilities on the works site to minimize visual impact to adjacent VSRs.	All works areas	Contractor		√	Υ
Cultural Herita	nge					
10.6.2	Vibration monitoring at Ex KCR Beacon Hill Tunnel during piling works of Administration Building	Work site	The Engineer /Contractor		V	N/A
Land Contamii	nation	1	1	1		.
11.7	Identify contamination and implement appropriate remedial measures on site. Provide relevant submission and obtain approval from EPD if necessary.	All works areas	Contractor	Guidance Note for Contaminated Land Assessment and Remediation Guidance Manual for Use of Risk based	V	N/A
				Remediation Goals for Contaminated Land Management (Guidance Manual)		
Hazard to Life		T	T			T-
Table 12.22	Ensure speed limit enforcement is specified in the contractor's Method Statement to limit the speed of construction vehicles on site	All works areas	The Engineer	EIAO-TM	$\sqrt{}$	Y
	Develop an audit procedure to ensure enforcement of speed limits and to ensure adequate site access control	All works areas	The Engineer		V	Υ
	Ensure construction method statement is endorsed by the Engineer (AECOM)	All works areas	The Engineer		√	Υ

	New access	Contractor/		V	Υ
,	road area	The Engineer			
0 , 1 , 1 , 0	All works areas	Contractor/		1	Υ
drills) cover the reprovisioning activities		The Engineer		•	'
Safety training to be provided to construction workers and WSD/Engineer	All works area	Contractor/		1	V
staff regarding evacuation procedures		The Engineer		1	Υ
Ensure communication protocol is in place between construction and	All works areas	Contractor/			
operation staff with regard to the change of chlorine delivery route and		The Engineer			N/A
the switchover from the existing to new chlorinated water piping;					
	All works areas	Contractor/		,	
movements during chlorine delivery		The Engineer		√	Υ
Provide a crash barrier between the construction site and the north side	Chlorination	Contractor			
	House area	3 01111 4 0101		√	Υ
	Chlorination	Contractor			
		Contractor		1	Υ
any damage of the Chlorination House	House area			\ \ \	ĭ
· -	Chlorination	Contractor	_		
	House area	Contractor		1	Υ
Chlorination House	riouse area			'	Į.
	Chlorination	Contractor			
=	House area	Contractor		√	Υ
·		MCD	<u> </u>		
	Chlorinated	WSD			
, , ,	water piping				N/A
for chlorine gas vapours being released if the concentration is too high					
and there is spillage during switchover Develop an operating procedure for performing the chlorinated water	All works areas	Contractor/			
switchover from the existing piping to new piping.	All WUIKS aleds	The Engineer /		1	N/A
switchover from the existing piping to new piping.		WSD		'	IN/A
Ensure the location/height of the lifting equipment is such there is no	Chlorination	Contractor/	_		
	House area	The Engineer		1	Υ
swinging or dropped load.	riouse area	THE LIIGHTEET		'	
	Existing E&M	Contractor/	 		
	Workshop	The Engineer			
	and	c ziigiiicci		1	N/A
	Chlorination			'	, , ,
	House				
		<u> </u>			 1

	areas			
Stop any construction activities which may lead to vibrations and potential slope/boulder disturbance during the chlorine deliveries	All works areas	Contractor	√	+
Installation of Chlorine gas monitors with audible alarms in the relevant reprovisioning works area	Reprovisioning works areas	Contractor/ The Engineer	V	
Provision of an accompanying vehicle for the chlorine truck on the WTW site and ensuring that during the chlorine drums delivery construction works are stopped and the construction workers moved away from Chlorination House	All works areas	Contractor	1	
Establish a liaison between the contractor and HKCG and develop a chlorine/town gas emergency plan to ensure gas safety during the Construction Phase	Beacon Hill North Gas Offtake Station and Gas Pipelines in Old Beacon Hill Tunnel	The Engineer / Contractor / HKCG	√	
Temporary suspend chlorine delivery during the short period of construction of the concerned section of elevated walkway to avoid mobile crane impact on the chlorine truck		The Engineer / Contractor	√	
Provide clear road signs for site vehicles	Chlorine delivery route and reprovisioning works access roads	The Engineer / Contractor	1	
Large equipment/plant movement should be controlled by 'Permit-to-move' system	All works areas	The Engineer / Contractor / WSD	V	
Define restricted zone for the equipment (i.e. keep the equipment from the Chlorination House at a safe distance). The extent of the restricted zone would be determined by the size of the equipment	Chlorination House area	The Engineer / Contractor	√	
Locate the construction site office at or near property boundary away from the Chlorination House as far as possible	Construction Office area	The Engineer / Contractor	V	
Entry of non-authorized personnel to the construction site to be prohibited	All works areas	Contractor	V	

12.15.4, 12.18.1, 12.22.9	GPS fleet management system with driver training to help enforce truck speeds	Chlorine delivery trucks, fleet management centre	WSD / Chlorine Supply Contractor	EIAO-TM	V	k.i.v.
	Improved clamps with independent checks to prevent load shedding	Chlorine	1		√	F
	Installation of fire screen and larger fire extinguishers to prevent engine and wheel fires from spreading to the cargo area	delivery trucks			V	F
	Adoption of the chlorine delivery route from Sham Shui Kok Dock to Sha Tin WTW				V	F
	Provision of emergency repair kit				V	F
12.34.3 Table 12.37	Ban the use of retreaded tyres and perform regular visual checks on the tyres.				√	F
& 12.38	A vehicle accompanying chlorine truck along critical road sections in Sha Tin. The truck should be equipped with emergency kit, fire extinguisher, radio set for communication. The accompanying vehicle will be ahead of the chlorine truck after the vehicles entering the water treatment works site – An accompanying vehicle may provide rapid response to an incident but any action would be limited to containing a small leak. Limit fuel tanks capacity at the beginning of the Project (Item 2.3 of Table				1	F
	12.37 – advance measure).				$\sqrt{}$	F
	Review the practicality of reducing combustible materials or use of fire retardant materials in the cab. (Item 2.3 of Table 12.37 – further measure)				√	k.i.v.
	Annual periodic radiography or ultrasonic test inspections of the chlorine drums should be considered for implementation as soon as feasible (Item 3.8 of Table 12.37).	Chlorine drums			√	k.i.v.
	Implement side, front and rear crash guards with high energy absorption in coordination and accordance with the relevant authorities.	Chlorine delivery trucks			√	k.i.v.
	Implement a sturdy steel frame to minimize the potential for chlorine release due to truck rollover				V	k.i.v.
12.34.4	WSD will continue to keep under review the latest development of use of alternative disinfectants in water supply industry to aim at minimising on-site chlorine storage.4	Chlorine delivery Route	WSD		V	k.i.v.

Training should be provided for the use of the GPS fleet management and improved safe driving.	√	k.i.
Ensured that independent checks are performed to ensure proper chlorine drum latching and clamping.	√	F
Chlorine truck drivers or driver attendants should be further trained to check and detect potential chlorine leaks during transport. This should include the timely application of the emergency kit.	√	k.i
Training should be provided to driver and driver attendant for the emergency use of the new 2 × 9L AFFF extinguishers.	√	F
Induction training for new drivers and driver attendant should include familiarisation with the route, familiarisation with chlorine risks, defensive driving, application of emergency kits, use of fire extinguishers and emergency response	√	k.i
Provision of a fire screen between the cab and cargo as well as fire retardant materials for the wheel arches on the chlorine truck should be planned and provided	√	F
To keep under review alternate chlorine receiving dock in Sha Tin/Tai Po area for chlorine delivery to STWTW.	√	k.i

Legend

- D Design Phase
- C Construction Phase
- O Operation Phase
- Y Compliance of Mitigation Measures
- N/A Not Applicable in Reporting Period
- k.i.v Keep In View
- F Completed

Appendix V Cumulative Statistics on Exceedances, Complaints, Notifications of Summons and Successful Prosecutions

Statistical Summary of Exceedances (Air Quality)

				Ai	r Quality	7			
Location	A	Action Level				Limit Level			
AM1		0				0			0
AM2		0				0			0
Noise									
Location	A	ction Lev	el		I	imit Leve	el		Total
NM1		0				0			0
NM2		0				0			0
NM3		0				0			0
				Wat	ter Qualit				
Location		Action	Level			Limit	Level		Total
Location	DO	Turbidity	SS	pН	DO	Turbidity	SS	pН	Iotai
C1	0	0	0	0	0	0	0	0	0
C2	0	0	0	0	0	0	0	0	0
C3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0
M1	0	0	0	0	0	0	0	0	0
M2	0	0	0	0	0	0	0	0	0
M3	0	0	0	0	0	0	0	0	0

Statistical Summary of Environmental Complaints

Reporting	Environmental Complaint Statistics						
Period	Frequency	Frequency Cumulative Complaint Natur					
1 Mar - 31 Mar	0	3	Water Quality				

Statistical Summary of Environmental Summons

Reporting	Environmental Summons Statistics						
Period	Frequency	Details					
1 Mar -	0	0	N/A				
31 Mar	U	O	IV/A				

Statistical Summary of Environmental Prosecution

Reporting	Environmental Prosecution Statistics						
Period	Frequency	Frequency Cumulative					
1 Mar -	0	0	NI/A				
31 Mar	U	U	N/A				

Appendix W

Project no.: CJO-3113

Tentative schedule for environmental monitoring

Impact Monitoring Schedule for STWTW

Apr-17								
Sun	Mon	Tue	Wed	Thur	Fri	Sat		
Suil	With	lue	wed	mu	FII	1		
						1		
2	3	4	5	6	7	8		
	Impact		Impact		Impact			
	Water Quality monitoring for C1,		Water Quality monitoring for C1,		Water Quality monitoring for C1,			
	C2, C3, M1, M2 & M3		C2, C3, M1, M2 & M3		C2, C3, M1, M2 & M3			
	Air monitoring for AM1 & AM2				Air monitoring for AM1 & AM2			
	Noise monitoring for NM1, NM2				Noise monitoring for NM1, NM2			
	& NM3				& NM3			
	Ø IAIND				CIVINI			
9	10	11	12	13	14	15		
		Impact		Impact				
		impact		impact				
		W		Material Constitution and the size of the Col				
		Water Quality monitoring for C1,		Water Quality monitoring for C1,				
		C2, C3, M1, M2 & M3		C2, C3, M1, M2 & M3				
				Air monitoring for AM1 & AM2				
				Noise monitoring for NM1, NM2				
				& NM3				
		ll control of the con		57.11115				
16	17	10	10	20	21	22		
16	17		19	20	21	22		
16	17	18 Impact	19	20 Impact	21	22 Impact		
16	17	Impact	19	Impact	21	Impact		
16	17	Impact Water Quality monitoring for C1,	19	Impact Water Quality monitoring for C1,	21	Impact Water Quality monitoring for C1,		
16	17	Impact Water Quality monitoring for C1,	19	Impact Water Quality monitoring for C1,	21	Impact Water Quality monitoring for C1,		
16	17	Impact Water Quality monitoring for C1, C2, C3, M1, M2 & M3	19	Impact	21	Impact		
16	17	Impact Water Quality monitoring for C1, C2, C3, M1, M2 & M3 Air monitoring for AM1 & AM2	19	Impact Water Quality monitoring for C1,	21	Impact Water Quality monitoring for C1,		
16	17	Impact Water Quality monitoring for C1, C2, C3, M1, M2 & M3 Air monitoring for AM1 & AM2 Noise monitoring for NM1, NM2	19	Impact Water Quality monitoring for C1,	21	Impact Water Quality monitoring for C1,		
16	17	Impact Water Quality monitoring for C1, C2, C3, M1, M2 & M3 Air monitoring for AM1 & AM2	19	Impact Water Quality monitoring for C1,	21	Impact Water Quality monitoring for C1,		
		Impact Water Quality monitoring for C1, C2, C3, M1, M2 & M3 Air monitoring for AM1 & AM2 Noise monitoring for NM1, NM2 & NM3		Impact Water Quality monitoring for C1, C2, C3, M1, M2 & M3		Impact Water Quality monitoring for C1, C2, C3, M1, M2 & M3		
23	17 24	Impact Water Quality monitoring for C1, C2, C3, M1, M2 & M3 Air monitoring for AM1 & AM2 Noise monitoring for NM1, NM2 & NM3	19	Impact Water Quality monitoring for C1,	21 22 28	Impact Water Quality monitoring for C1,		
	24	Impact Water Quality monitoring for C1, C2, C3, M1, M2 & M3 Air monitoring for AM1 & AM2 Noise monitoring for NM1, NM2 & NM3	26	Impact Water Quality monitoring for C1, C2, C3, M1, M2 & M3	28	Impact Water Quality monitoring for C1, C2, C3, M1, M2 & M3		
		Impact Water Quality monitoring for C1, C2, C3, M1, M2 & M3 Air monitoring for AM1 & AM2 Noise monitoring for NM1, NM2 & NM3		Impact Water Quality monitoring for C1, C2, C3, M1, M2 & M3		Impact Water Quality monitoring for C1, C2, C3, M1, M2 & M3		
	24 Impact	Impact Water Quality monitoring for C1, C2, C3, M1, M2 & M3 Air monitoring for AM1 & AM2 Noise monitoring for NM1, NM2 & NM3	26 Impact	Impact Water Quality monitoring for C1, C2, C3, M1, M2 & M3	28 Impact	Impact Water Quality monitoring for C1, C2, C3, M1, M2 & M3		
	24 Impact Water Quality monitoring for C1,	Impact Water Quality monitoring for C1, C2, C3, M1, M2 & M3 Air monitoring for AM1 & AM2 Noise monitoring for NM1, NM2 & NM3	26 Impact Water Quality monitoring for C1,	Impact Water Quality monitoring for C1, C2, C3, M1, M2 & M3	28 Impact Water Quality monitoring for C1,	Impact Water Quality monitoring for C1, C2, C3, M1, M2 & M3		
	Impact Water Quality monitoring for C1, C2, C3, M1, M2 & M3	Impact Water Quality monitoring for C1, C2, C3, M1, M2 & M3 Air monitoring for AM1 & AM2 Noise monitoring for NM1, NM2 & NM3	26 Impact	Impact Water Quality monitoring for C1, C2, C3, M1, M2 & M3	28 Impact Water Quality monitoring for C1, C2, C3, M1, M2 & M3	Impact Water Quality monitoring for C1, C2, C3, M1, M2 & M3		
	Impact Water Quality monitoring for C1, C2, C3, M1, M2 & M3 Air monitoring for AM1 & AM2	Impact Water Quality monitoring for C1, C2, C3, M1, M2 & M3 Air monitoring for AM1 & AM2 Noise monitoring for NM1, NM2 & NM3	26 Impact Water Quality monitoring for C1,	Impact Water Quality monitoring for C1, C2, C3, M1, M2 & M3	Impact Water Quality monitoring for C1, C2, C3, M1, M2 & M3 Air monitoring for AM1 & AM2	Impact Water Quality monitoring for C1, C2, C3, M1, M2 & M3		
	Impact Water Quality monitoring for C1, C2, C3, M1, M2 & M3 Air monitoring for AM1 & AM2	Impact Water Quality monitoring for C1, C2, C3, M1, M2 & M3 Air monitoring for AM1 & AM2 Noise monitoring for NM1, NM2 & NM3	26 Impact Water Quality monitoring for C1,	Impact Water Quality monitoring for C1, C2, C3, M1, M2 & M3	Impact Water Quality monitoring for C1, C2, C3, M1, M2 & M3 Air monitoring for AM1 & AM2	Impact Water Quality monitoring for C1, C2, C3, M1, M2 & M3		
	24 Impact Water Quality monitoring for C1, C2, C3, M1, M2 & M3 Air monitoring for AM1 & AM2 Noise monitoring for NM1, NM2	Impact Water Quality monitoring for C1, C2, C3, M1, M2 & M3 Air monitoring for AM1 & AM2 Noise monitoring for NM1, NM2 & NM3	26 Impact Water Quality monitoring for C1,	Impact Water Quality monitoring for C1, C2, C3, M1, M2 & M3	Impact Water Quality monitoring for C1, C2, C3, M1, M2 & M3 Air monitoring for AM1 & AM2 Noise monitoring for NM1, NM2	Impact Water Quality monitoring for C1, C2, C3, M1, M2 & M3		
	Impact Water Quality monitoring for C1, C2, C3, M1, M2 & M3 Air monitoring for AM1 & AM2	Impact Water Quality monitoring for C1, C2, C3, M1, M2 & M3 Air monitoring for AM1 & AM2 Noise monitoring for NM1, NM2 & NM3	26 Impact Water Quality monitoring for C1,	Impact Water Quality monitoring for C1, C2, C3, M1, M2 & M3	Impact Water Quality monitoring for C1, C2, C3, M1, M2 & M3 Air monitoring for AM1 & AM2	Impact Water Quality monitoring for C1, C2, C3, M1, M2 & M3		
23	24 Impact Water Quality monitoring for C1, C2, C3, M1, M2 & M3 Air monitoring for AM1 & AM2 Noise monitoring for NM1, NM2	Impact Water Quality monitoring for C1, C2, C3, M1, M2 & M3 Air monitoring for AM1 & AM2 Noise monitoring for NM1, NM2 & NM3	26 Impact Water Quality monitoring for C1,	Impact Water Quality monitoring for C1, C2, C3, M1, M2 & M3	Impact Water Quality monitoring for C1, C2, C3, M1, M2 & M3 Air monitoring for AM1 & AM2 Noise monitoring for NM1, NM2	Impact Water Quality monitoring for C1, C2, C3, M1, M2 & M3		
	24 Impact Water Quality monitoring for C1, C2, C3, M1, M2 & M3 Air monitoring for AM1 & AM2 Noise monitoring for NM1, NM2	Impact Water Quality monitoring for C1, C2, C3, M1, M2 & M3 Air monitoring for AM1 & AM2 Noise monitoring for NM1, NM2 & NM3	26 Impact Water Quality monitoring for C1,	Impact Water Quality monitoring for C1, C2, C3, M1, M2 & M3	Impact Water Quality monitoring for C1, C2, C3, M1, M2 & M3 Air monitoring for AM1 & AM2 Noise monitoring for NM1, NM2	Impact Water Quality monitoring for C1, C2, C3, M1, M2 & M3		
23	24 Impact Water Quality monitoring for C1, C2, C3, M1, M2 & M3 Air monitoring for AM1 & AM2 Noise monitoring for NM1, NM2	Impact Water Quality monitoring for C1, C2, C3, M1, M2 & M3 Air monitoring for AM1 & AM2 Noise monitoring for NM1, NM2 & NM3	26 Impact Water Quality monitoring for C1,	Impact Water Quality monitoring for C1, C2, C3, M1, M2 & M3	Impact Water Quality monitoring for C1, C2, C3, M1, M2 & M3 Air monitoring for AM1 & AM2 Noise monitoring for NM1, NM2	Impact Water Quality monitoring for C1, C2, C3, M1, M2 & M3		
23	24 Impact Water Quality monitoring for C1, C2, C3, M1, M2 & M3 Air monitoring for AM1 & AM2 Noise monitoring for NM1, NM2	Impact Water Quality monitoring for C1, C2, C3, M1, M2 & M3 Air monitoring for AM1 & AM2 Noise monitoring for NM1, NM2 & NM3	26 Impact Water Quality monitoring for C1,	Impact Water Quality monitoring for C1, C2, C3, M1, M2 & M3	Impact Water Quality monitoring for C1, C2, C3, M1, M2 & M3 Air monitoring for AM1 & AM2 Noise monitoring for NM1, NM2	Impact Water Quality monitoring for C1, C2, C3, M1, M2 & M3		
23	24 Impact Water Quality monitoring for C1, C2, C3, M1, M2 & M3 Air monitoring for AM1 & AM2 Noise monitoring for NM1, NM2	Impact Water Quality monitoring for C1, C2, C3, M1, M2 & M3 Air monitoring for AM1 & AM2 Noise monitoring for NM1, NM2 & NM3	26 Impact Water Quality monitoring for C1,	Impact Water Quality monitoring for C1, C2, C3, M1, M2 & M3	Impact Water Quality monitoring for C1, C2, C3, M1, M2 & M3 Air monitoring for AM1 & AM2 Noise monitoring for NM1, NM2	Impact Water Quality monitoring for C1, C2, C3, M1, M2 & M3		
23	24 Impact Water Quality monitoring for C1, C2, C3, M1, M2 & M3 Air monitoring for AM1 & AM2 Noise monitoring for NM1, NM2	Impact Water Quality monitoring for C1, C2, C3, M1, M2 & M3 Air monitoring for AM1 & AM2 Noise monitoring for NM1, NM2 & NM3	26 Impact Water Quality monitoring for C1,	Impact Water Quality monitoring for C1, C2, C3, M1, M2 & M3	Impact Water Quality monitoring for C1, C2, C3, M1, M2 & M3 Air monitoring for AM1 & AM2 Noise monitoring for NM1, NM2	Impact Water Quality monitoring for C1, C2, C3, M1, M2 & M3		
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23	24 Impact Water Quality monitoring for C1, C2, C3, M1, M2 & M3 Air monitoring for AM1 & AM2 Noise monitoring for NM1, NM2	Impact Water Quality monitoring for C1, C2, C3, M1, M2 & M3 Air monitoring for AM1 & AM2 Noise monitoring for NM1, NM2 & NM3	26 Impact Water Quality monitoring for C1,	Impact Water Quality monitoring for C1, C2, C3, M1, M2 & M3	Impact Water Quality monitoring for C1, C2, C3, M1, M2 & M3 Air monitoring for AM1 & AM2 Noise monitoring for NM1, NM2	Impact Water Quality monitoring for C1, C2, C3, M1, M2 & M3		
23	24 Impact Water Quality monitoring for C1, C2, C3, M1, M2 & M3 Air monitoring for AM1 & AM2 Noise monitoring for NM1, NM2	Impact Water Quality monitoring for C1, C2, C3, M1, M2 & M3 Air monitoring for AM1 & AM2 Noise monitoring for NM1, NM2 & NM3	26 Impact Water Quality monitoring for C1,	Impact Water Quality monitoring for C1, C2, C3, M1, M2 & M3	Impact Water Quality monitoring for C1, C2, C3, M1, M2 & M3 Air monitoring for AM1 & AM2 Noise monitoring for NM1, NM2	Impact Water Quality monitoring for C1, C2, C3, M1, M2 & M3		
23	24 Impact Water Quality monitoring for C1, C2, C3, M1, M2 & M3 Air monitoring for AM1 & AM2 Noise monitoring for NM1, NM2	Impact Water Quality monitoring for C1, C2, C3, M1, M2 & M3 Air monitoring for AM1 & AM2 Noise monitoring for NM1, NM2 & NM3	26 Impact Water Quality monitoring for C1,	Impact Water Quality monitoring for C1, C2, C3, M1, M2 & M3	Impact Water Quality monitoring for C1, C2, C3, M1, M2 & M3 Air monitoring for AM1 & AM2 Noise monitoring for NM1, NM2	Impact Water Quality monitoring for C1, C2, C3, M1, M2 & M3		
23	24 Impact Water Quality monitoring for C1, C2, C3, M1, M2 & M3 Air monitoring for AM1 & AM2 Noise monitoring for NM1, NM2	Impact Water Quality monitoring for C1, C2, C3, M1, M2 & M3 Air monitoring for AM1 & AM2 Noise monitoring for NM1, NM2 & NM3	26 Impact Water Quality monitoring for C1,	Impact Water Quality monitoring for C1, C2, C3, M1, M2 & M3	Impact Water Quality monitoring for C1, C2, C3, M1, M2 & M3 Air monitoring for AM1 & AM2 Noise monitoring for NM1, NM2	Impact Water Quality monitoring for C1, C2, C3, M1, M2 & M3		

Impact Monitoring Schedule for STWTW

Impact Monitoring Schedule for STWTW							
			May-17				
Sun	Mon	Tue	Wed		Fri	Sat	
	1	2	3	4	5	6	
		Impact Water Quality monitoring for C1, C2, C3, M1, M2 & M3		Impact Water Quality monitoring for C1, C2, C3, M1, M2 & M3 Air monitoring for AM1 & AM2		Impact Water Quality monitoring for C1, C2, C3, M1, M2 & M3	
				Noise monitoring for NM1, NM2 & NM3			
7	8	9	10	11	12	13	
	Impact Water Quality monitoring for C1, C2, C3, M1, M2 & M3 Air monitoring for AM1 & AM2 Noise monitoring for NM1, NM2 & NM3		Impact Water Quality monitoring for C1, C2, C3, M1, M2 & M3		Impact Water Quality monitoring for C1, C2, C3, M1, M2 & M3 Air monitoring for AM1 & AM2 Noise monitoring for NM1, NM2 & NM3		
14	15	16	17	18	19	20	
	Impact Water Quality monitoring for C1, C2, C3, M1, M2 & M3		Impact Water Quality monitoring for C1, C2, C3, M1, M2 & M3 Air monitoring for AM1 & AM2 Noise monitoring for NM1, NM2 & NM3		Impact Water Quality monitoring for C1, C2, C3, M1, M2 & M3		
21	22	23	24	25	26	27	
	Impact Water Quality monitoring for C1, C2, C3, M1, M2 & M3 Air monitoring for AM1 & AM2 Noise monitoring for NM1, NM2 & NM3		Impact Water Quality monitoring for C1, C2, C3, M1, M2 & M3		Impact Water Quality monitoring for C1, C2, C3, M1, M2 & M3 Air monitoring for AM1 & AM2 Noise monitoring for NM1, NM2 & NM3		
28	29	30	31				
	Impact Water Quality monitoring for C1, C2, C3, M1, M2 & M3		Impact Water Quality monitoring for C1, C2, C3, M1, M2 & M3 Air monitoring for AM1 & AM2 Noise monitoring for NM1, NM2 & NM3				

Impact Monitoring Schedule for STWTW

Impact Monitoring Schedule for STWTW Jun-17							
Sun	Mon	Tue	Wed	Thur	Fri	Sat	
-				1	2	3	
4	5 Impact Water Quality monitoring for	6	7 Impact Water Quality monitoring for	8	Impact Water Quality monitoring for C1, C2, C3, M1, M2 & M3 Impact Water Quality monitoring for	10	
	C1, C2, C3, M1, M2 & M3 Air monitoring for AM1 & AM2 Noise monitoring for NM1, NM2 & NM3		C1, C2, C3, M1, M2 & M3		C1, C2, C3, M1, M2 & M3 Air monitoring for AM1 & AM2 Noise monitoring for NM1, NM2 & NM3		
11	12	13	14	15	16	17	
	Impact Water Quality monitoring for C1, C2, C3, M1, M2 & M3		Impact Water Quality monitoring for C1, C2, C3, M1, M2 & M3 Air monitoring for AM1 & AM2 Noise monitoring for NM1, NM2 & NM3		Impact Water Quality monitoring for C1, C2, C3, M1, M2 & M3		
18	19	20	21	22	23	24	
	Impact Water Quality monitoring for C1, C2, C3, M1, M2 & M3 Air monitoring for AM1 & AM2 Noise monitoring for NM1, NM2 & NM3		Impact Water Quality monitoring for C1, C2, C3, M1, M2 & M3		Impact Water Quality monitoring for C1, C2, C3, M1, M2 & M3 Air monitoring for AM1 & AM2 Noise monitoring for NM1, NM2 & NM3		
25	26	27	28	29	30		
	Impact Water Quality monitoring for C1, C2, C3, M1, M2 & M3		Impact Water Quality monitoring for C1, C2, C3, M1, M2 & M3 Air monitoring for AM1 & AM2 Noise monitoring for NM1, NM2 & NM3		Impact Water Quality monitoring for C1, C2, C3, M1, M2 & M3		