


Drainage Services Department
**Advance Works for Shek Wu Hui Sewage
Treatment Works – Further Expansion Phase 1A**

Monthly EM&A Report

(July 2018)

Verified by : Mr. Adi Lee 

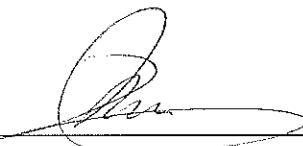
Position : Independent Environmental Checker

Date : 15/8/2018

Drainage Services Department
Advance Works for Shek Wu Hui Sewage
Treatment Works – Further Expansion Phase 1A

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Certified by : Mr. T. W. Tam 

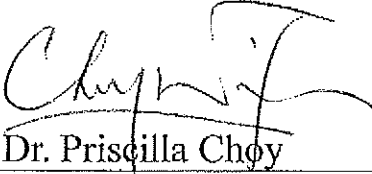
Position : Environmental Team Leader of
Contract No. DC/2013/09

Date : 14 - 8 - 2018

Drainage Services Department
**Advance Works for Shek Wu Hui Sewage
Treatment Works – Further Expansion Phase 1A**

Monthly EM&A Report

(July 2018)

Certified by : 
Dr. Priscilla Choy

Position : Environmental Team Leader of
Contract No. DE/2014/01

Date : 14 August 2018

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1. EXECUTIVE SUMMARY

This is the Monthly EM&A Report for the Project which summarises the EM&A works undertaken by the ETs of the respective Contractors of Contract No. DC/2013/09 and No. DE/2014/01 under FEP No. FEP-02/474/2013 in July 2018 (the reporting period).

1.1 Summary of Major Construction Works taken in the Reporting Period

1.1.1 In the reporting period, the major construction works being undertaken by the respective Contractors are summarized in the below table.

Works Contract	Contract Title	Major Construction Works
DC/2013/09	Advance Works for Shek Wu Hui Sewage Treatment Works – Further Expansion Phase 1A and Sewerage Works at Ping Che Road	<ul style="list-style-type: none"> • Reinstatement of Concrete Pavement
DE/2014/01	Provision of Electrical and Mechanical Facilities for Shek Wu Hui Sewage Treatment Works – Further Expansion Phase 1A – Advance Works and Ng Chow South Road Sewage Pumping Station	<ul style="list-style-type: none"> • Installation of Building Services at MBR Facilities Building • Mechanical Installation of Air Blowers and associated accessories at 1/F, MBR Facilities Building • Mechanical Installation of MBR Pre-treatment Screen Facilities • Mechanical Installation in Bioreactor No.1 (BR1) • Electrical Installation in LV Switchroom and 11kV HV Switchroom at G/F, MBR Facilities Building • Electrical Installation in 3.3kV HV Switchroom and Transformer Room No.2 at 1/F, MBR Facilities Building

1.2 Environmental Monitoring and Audit Activities

1.2.1 The environmental monitoring activities under the EM&A programme are summarized in the below table. No Action and Limit Level exceedance of air quality and construction noise monitoring was recorded during the reporting period.

Environmental Issue	Environmental Monitoring Parameters / Inspection	Occasions	Action Level Exceedance	Limit Level Exceedance
Air Quality	1-hour TSP	30	0	0
	24-hour TSP	10	0	0
Construction Noise	L _{Aeq(30min)} Daytime	8	0	0

1.3 Environmental Complaint

1.3.1 No environmental complaint, notification of summons or successful prosecutions were received during the reporting period. It is summarized in the below table.

Works Contract	Environmental Complaints	Notification of Summons	Successful Prosecutions	Status / Follow-up Actions
DC/2013/09	0	0	0	N/A
DE/2014/01	0	0	0	N/A

1.4 Site Inspection

1.4.1 Joint site inspections to evaluate the site environmental performance by the RE, the respective ETs and the Contractors were carried out on the following dates during the reporting period.

Contract No. DC/2013/09: 5, 12, 19, 26 and 31 July 2018

Contract No. DE/2014/01: 5, 13, 19, 26 and 31 July 2018

1.4.2 IEC conducted site audit on 31 July 2018. No environmental non-compliance was identified in the reporting period.

1.5 Reporting Changes

1.5.1 There were no reporting changes during the reporting period.

1.6 Future Key Issues

1.6.1 Key issues to be considered in the next reporting period for the Project are as follow:

Works Contract	Major Construction Works	Potential Pollution Issues	Mitigation Measures
DC/2013/09	<ul style="list-style-type: none"> Any remaining road reinstatement works and defect rectification works 	<ul style="list-style-type: none"> Potential dust impact for any works involves dusty material handling 	<ul style="list-style-type: none"> Implement dust suppression measures during dusty material handling
DE/2014/01	<ul style="list-style-type: none"> Electrical Installation in LV Switchroom and 11kV HV Switchroom at G/F, MBR Facilities Building Electrical Installation in 3.3kV HV Switch room and Transformer Room No.2 at 1/F, MBR Facilities Building Electrical Installation in LV Switchroom No.3 Mechanical Installation of Air Blowers and associated accessories at 1/F, MBR Facilities Building Mechanical Installation of MBR Pre-treatment Screen Facilities Mechanical Installation of Bioreactor No.1 (BR1) Mechanical Installation in Chemical Rooms 	<ul style="list-style-type: none"> Storage of chemicals containers Waste accumulation Silt and dust getting into the public area by the leaving site vehicles at the site exits without adequate wheel washing facilities 	<ul style="list-style-type: none"> Drip tray should be provided to chemical containers Waste should be disposed properly and avoid accumulation Accumulated materials to be recycled onsite Wheel washing should be provided to vehicles before leaving the site area

2. INTRODUCTION

2.1 Background

- 2.1.1 The existing Shek Wu Hui Sewage Treatment Works (SWHSTW) is operated and maintained by the Drainage Services Department (DSD). It provides secondary level treatment to sewage collected from Sheung Shui, Fanling and adjacent areas, with design capacity of 93,000m³/day at ADWF.
- 2.1.2 To cope with the latest population growth and new developments in the catchment, further expansion of SWHSTW is planned to be carried out in three phases, namely Phases 1A, 1B and 2. Further Expansion Phase 1A is to cope with the forecast increase in sewage flow from local developments and extension of village sewerage in Sheung Shui, Fanling and adjacent areas. The scope of the Phase 1A Project comprises the followings:
- (a) the construction of proposed treatment facilities to increase the treatment capacity of SWHSTW by at least 40,000m³/day with tertiary treatment level, with suitable allowance to cater for a further increase of treatment capacity by 20,000m³/day in Phase 1B; and
 - (b) modification/upgrading of the existing facilities of SWHSTW.
- 2.1.3 To cope with the projected sewage flow buildup and meet the tight implementation programme, Advance Works for SWHSTW Further Expansion Phase 1A (hereinafter referred as “the Project”) are proposed to be carried out between 2015 and 2018. The Phase 1A Advance Works comprise a civil works contract and an Electrical & Mechanical (E&M) works contract. The civil works Contract No. DC/2013/09 “Advance Works for Shek Wu Hui Sewage Treatment Works – Further Expansion Phase 1A and Sewerage Works at Ping Che Road” is supervised by the Sewerage Projects Division (SPD) of DSD. The E&M works Contract No. DE/2014/01 “Provision of Electrical and Mechanical Facilities for Shek Wu Hui Sewage Treatment Works – Further Expansion Phase 1A – Advance Works and Ng Chow South Road Sewage Pumping Station” is supervised by the Electrical & Mechanical Projects Division (E&MPD) of DSD.
- 2.1.4 The scope of Phase 1A Advance Works comprises the followings:
- (a) the conversion of one existing bioreactor (BR1) and two existing final sedimentation tanks (FST1 and FST2) into one membrane bioreactor; and
 - (b) the ancillary works.
- 2.1.5 This Project is a part of designated project under item F.2 of Part 1, Schedule 2 of the Environmental Impact Assessment (EIA) Ordinance. The EIA for the further expansion of SWHSTW Phases 1A, 1B and 2 is covered under the EIA Report of NENT NDAs (Register No. AEIAR-175-2013).
- 2.1.6 An Environment Permit (EP) No. EP-474/2013 for the further expansion of SWHSTW Phases 1A, 1B and 2 was issued by EPD to CEDD on 21 November 2013. On 23 January 2014, Further Environmental Permit (FEP) No. FEP-01/474/2013 was issued by EPD to DSD for the further expansion of SWHSTW Phase 1A works. On 15 February 2018, FEP No. FEP-02/474/2013 was issued by EPD to DSD covering the upgrading works of SWHSTW Phases 1A, 1B and 2.
- 2.1.7 With the issue of FEP No. FEP-02/474/2013, DSD will surrender FEP No. FEP-01/474/2013 which covering Phase 1A works only.

2.2 Project Programme

Two construction works contracts of the Project, i.e. civil works and E&M works, were awarded in 2015 and 2016 respectively. The construction of the Project commenced in October 2015 and is expected to complete in 2018 tentatively. *Table 2.1* summarises the information of the awarded Works Contracts.

Table 2.1 Summary of Awarded Works Contracts

Works Contract	Description	Construction Start Date	Contractor	Environmental Team
DC/2013/09	Advance Works for Shek Wu Hui Sewage Treatment Works – Further Expansion Phase 1A and Sewerage Works at Ping Che Road	October 2015	Tsun Yip Waterworks Construction Co Ltd (Tsun Yip)	Action-United Environmental Services & Consulting (AUES)
DE/2014/01	Provision of Electrical and Mechanical Facilities for Shek Wu Hui Sewage Treatment Works – Further Expansion Phase 1A – Advance Works and Ng Chow South Road Sewage Pumping Station	October 2017	Jardine Engineering Corporation Limited (JEC)	Cinotech Consultants Limited (Cinotech)

2.3 Purpose of the Report

- 2.3.1 The Environmental Monitoring and Audit (EM&A) programme for DC/2013/09 and DE/2014/01 commenced in October 2015 and October 2017 respectively. This is the Monthly EM&A Report for the Project which summarises the EM&A works undertaken by the respective Contractor's ETs in July 2018 (the reporting period).

2.4 Project Organization

Organization structure and contact details of relevant parties with respect to on-site environmental management are shown in *Table 2.2* below.

Table 2.2 Key Project Contacts

Works Contract	Organization	Role	Name	Tel No.
DC/2013/09	DSD	Resident Engineer	Ms. Konica Cheung	2594 7463
	ANewR Consulting Limited	Independent Environmental Checker	Mr. Adi Lee	2618 2836
	Tsun Yip	Site Agent	Mr. Ken Wong	9161 9627
		Environmental Officer	Mr. M. T. Ho	9507 9634
	AUES	Environmental Team Leader	Mr. T. W. Tam	2959 6059
DE/2014/01	DSD	Resident Engineer	Mr. Mo Fong	2594 7329
	ANewR Consulting Limited	Independent Environmental Checker	Mr. Adi Lee	2618 2836
	JEC	Project Manager	Mr. Kim Hung Lau	2947 1125
		Environmental Officer	Mr. George Ng	2947 1125
	Cinotech	Environmental Team Leader	Dr. Priscilla Choy	2151 2089

3. ENVIRONMENTAL MONITORING AND AUDIT

- 3.1 The Project has been divided into two construction works contracts which are covered by EP No. EP-474/2013 and FEP No. FEP-02/474/2013. As per the EP Conditions, EM&A Reports for Works Contract No. DC/2013/09 and No. DE/2014/01 prepared by the respective Contractor’s ETs are provided in *Appendices A and B* respectively.
- 3.2 The EM&A Reports provide details of the project information, EM&A requirements, impact monitoring and audit results for the corresponding Contracts.
- 3.3 A summary of the major construction activities undertaken by the respective Contractors of various Works Contracts during the reporting period are presented in *Table 3.1*.

Table 3.1 Summary of Major Construction Activities in the Reporting Period

Works Contract	Contract Title	Major Construction Works
DC/2013/09	Advance Works for Shek Wu Hui Sewage Treatment Works – Further Expansion Phase 1A and Sewerage Works at Ping Che Road	<ul style="list-style-type: none"> • Reinstatement of Concrete Pavement
DE/2014/01	Provision of Electrical and Mechanical Facilities for Shek Wu Hui Sewage Treatment Works – Further Expansion Phase 1A – Advance Works and Ng Chow South Road Sewage Pumping Station	<ul style="list-style-type: none"> • Installation of Building Services at MBR Facilities Building • Mechanical Installation of Air Blowers and associated accessories at 1/F, MBR Facilities Building • Mechanical Installation of MBR Pre-treatment Screen Facilities • Mechanical Installation in Bioreactor No.1 (BR1) • Electrical Installation in LV Switchroom and 11kV HV Switchroom at G/F, MBR Facilities Building • Electrical Installation in 3.3kV HV Switchroom and Transformer Room No.2 at 1/F, MBR Facilities Building

- 3.4 Impact monitoring for air quality and construction noise were conducted in accordance with the Updated EM&A Manual in the reporting period. The air quality and construction noise for this reporting month are summarised in *Tables 3.2 to 3.4*. Details of the monitoring requirements, locations, equipment, methodology and QA/QC procedures are presented in the EM&A Reports as provided in *Appendices A and B*.
- 3.5 No Action and Limit Level exceedance of air quality and construction noise monitoring was recorded during the reporting period.

- 3.6 No environmental complaint, notification of summons or successful prosecutions were received during the reporting period. Log for environmental complaints, notification of summons and successful prosecutions are provided in *Table 3.5*.
- 3.7 Regular site inspections were conducted by the respective Contractor’s ETs on a weekly basis to check the implementation of environmental pollution control and mitigation measures for the Project. No non-compliance was identified in the reporting period. Joint site inspections for Contract No. DC/2013/09 were carried out on 5, 12, 19, 26 and 31 July 2018 and for Contract No. DE/2014/01 were carried out on 5, 13, 19, 26 and 31 July 2018 during the reporting period. No environmental non-compliance was identified in the reporting period.

Table 3.2 Summary of 1-Hour TSP Monitoring Results in the Reporting Period

Monitoring Station ID	Location	TSP Concentration (mg/m ³)	Action Level (mg/m ³)	Limit Level (mg/m ³)	Exceedance due to the Project Construction (Yes/No)
AM1	No. 31 Wai Loi Tsuen	29-84	286	500	No
AM2	Fu Tei Au	26-101	276	500	No

Note:

- (1) The environmental monitoring works of the Project were conducted by the Environmental Team of Contract No. DC/2013/09 in accordance with the Updated EM&A Manual.

Table 3.3 Summary of 24-Hour TSP Monitoring Results in the Reporting Period

Monitoring Station ID	Location	TSP Concentration (mg/m ³)	Action Level (mg/m ³)	Limit Level (mg/m ³)	Exceedance due to the Project Construction (Yes/No)
AM1	No. 31 Wai Loi Tsuen	11-36	147	260	No
AM2a	RE’s Site Office	19-39	155	260	No

Note:

- (1) The environmental monitoring works of the Project were conducted by the Environmental Team of Contract No. DC/2013/09 in accordance with the Updated EM&A Manual.

Table 3.4 Summary of Construction Noise Monitoring Results in the Reporting Period

Monitoring Station ID	Location	Noise Level (LAeq,30mins, dB(A))	Action Level (dB(A))	Limit Level (dB(A))	Exceedance due to the Project Construction (Yes/No)
NM1	No. 31 Wai Loi Tsuen	53-62	When one documented complaint is received	>75	No
NM2	Fu Tei Au	57-63		>75	No

Note:

- (1) The environmental monitoring works of the Project were conducted by the Environmental Team of Contract No. DC/2013/09 in accordance with the Updated EM&A Manual.

Table 3.5 Log for Environmental Complaints, Notification of Summons and Successful Prosecutions for the Reporting Month

Works Contract	Environmental Complaints	Notification of Summons	Successful Prosecutions
DC/2013/09	0	0	0
DE/2014/01	0	0	0

4. WASTE MANAGEMENT

- 4.1 Waste management was carried out by on-site Environmental Officer or an Environmental Supervisor of respective Contractors from time to time.
- 4.2 The quantities of waste for disposal in this Reporting Period are summarized in *Tables 4.1* and *4.2* and the Monthly Summary Waste Flow Tables of respective Contracts are presented in the EM&A Reports as provided in *Appendices A* and *B*. Whenever possible, materials were reused on-site as far as practicable.

Table 4.1 Summary of Quantities of Inert C&D Materials and C&D Wastes for Contract No. DC/2013/09

Type of Waste	Quantity			Disposal Location
	Prior Months	Reporting Month	Cumulated	
Total C&D Materials (Inert) (in '000m ³)	22.36	0.76	23.12	Tuen Mun 38
Hard Rock and Large Broken Concrete (Inert) (in '000m ³)	2.24	0.01	2.25	Tuen Mun 38
Reused in this Project (Inert) (in '000m ³)	3.47	0	3.47	--
Reused in other Projects (Inert) (in '000m ³)	2.23	0	2.23	
Disposal as Public Fill (Inert) (in '000m ³)	14.52	0.75	15.27	Tuen Mun 38
Metals (in '000kg)	142.00	0	142.00	--
Paper / Cardboard Packing (in '000kg)	0.07	0	0.07	--
Plastics (in '000kg)	0	0	0	--
Chemical Wastes (in '000kg)	0	0	0	--
General Refuses (in '000m ³)	1.11	0.03	1.14	NENT

Table 4.2 Summary of Quantities of Inert C&D Materials and C&D Wastes for Contract No. DE/2014/01

Type of Waste	Quantity			Disposal Location
	Prior Months	Reporting Month	Cumulated	
Total C&D Materials (Inert) (in '000m ³)	0	0	0	--
Hard Rock and Large Broken Concrete (Inert) (in '000m ³)	0	0	0	--
Reused in this Project (Inert) (in '000m ³)	0	0	0	--
Reused in other Projects (Inert) (in '000m ³)	0	0	0	--
Disposal as Public Fill (Inert) (in '000m ³)	0	0	0	--
Metals (in '000kg)	0	0	0	--
Paper / Cardboard Packing (in '000kg)	0	0	0	--
Plastics (in '000kg)	0	0	0	--
Chemical Wastes (in '000kg)	0	0	0	--
General Refuses (in tonne)	21.71	4.63	26.34	NENT

5. IMPLEMENTATION STATUS ON THE ENVIRONMENTAL PROTECTION REQUIREMENTS

5.1 The respective Contractors have implemented all mitigation measures and requirements as stated in the EIA Reports, EM&A Manuals, EP No. EP-474/2013 and FEP No. FEP-02/474/2013. Summary of the relevant permits, licenses, and/or notifications on environmental protection for this Project in this reporting period are summarised in *Tables 5.1* and *5.2*.

Table 5.1 Summary of Environmental Licenses and Permits for Contract No. DC/2013/09

Item	Valid License/Permit	License/Permit Number
1	Further Environmental Permit	FEP-02/474/2013 (Valid from 15 February 2018)
2	Air Pollution Control (Construction Dust) Regulation	N/A
3	Chemical Waste Producer Registration	WPN5213-624-T3148-04
4	Water Pollution Control Ordinance	WT00022503-2015
5	Billing Account for Disposal of Construction Waste	Account Number: 7022898

Table 5.2 Summary of Environmental Licenses and Permits for Contract No. DE/2014/01

Item	Valid License/Permit	License/Permit Number
1	Further Environmental Permit	FEP-02/474/2013 (Valid from 15 February 2018)
2	Chemical Waste Producer Registration	WPN5213-624-T3685-01
3	Billing Account for Disposal of Construction Waste	Account Number: 7024165

6. CONCLUSION AND RECOMMENDATION

6.1 Conclusion

- 6.1.1 This is the Monthly EM&A Report for the Project which summarises the EM&A works undertaken by the respective Contractor's ETs in July 2018 (the reporting period).
- 6.1.2 No Action and Limit Level exceedance of 1-hour and 24-hour TSP monitoring was recorded during the reporting period.
- 6.1.3 No Action and Limit Level exceedance of construction noise monitoring was recorded during the reporting period.
- 6.1.4 Joint site inspections to evaluate the site environmental performance by the RE, the respective ETs and the Contractors were carried out on the following dates during the reporting period.
- Contract No. DC/2013/09: 5, 12, 19, 26 and 31 July 2018
Contract No. DE/2014/01: 5, 13, 19, 26 and 31 July 2018
- 6.1.5 IEC conducted site audit on 31 July 2018. No environmental non-compliance was identified in the reporting period.
- 6.1.6 No documented complaint, notification of summons or successful prosecution was received during the reporting period.

6.2 Recommendation

- 6.2.1 The following recommendations were made for future reporting periods:

Air Quality

- Maintain wet surface on access road
- All vehicles must be used wheel washing facility before off site
- Spray water during breaking works
- A cleaning truck was regularly performed on the public road to prevent fugitive dust emission

Noise

- Restrain operation time of plants from 07:00 to 19:00 on any working day except for Public Holiday and Sunday.
- Keep good maintenance of plants
- Shut down the plants when not in used

Water Quality

- Identify any discharge of wastewater from the construction site
- Avoid blockage of U channel and drainage system by sediment
- Avoid water accumulation on site and carry out larviciding against mosquito breeding for stagnant water when mosquito larvae are observed
- Avoid spoilage of run-off from construction site to public area
- The discharge quality must meet the requirements specified in the discharge license

Waste/Chemical Management

- On-site sorting prior to disposal
- Follow requirements and procedures of the "Trip-ticket System"
- Predict required quantity of concrete accurately
- Collect the unused fresh concrete at designated locations in the sites for subsequent disposal

APPENDIX A

MONTHLY EM&A REPORT FOR CONTRACT NO. DC/2013/09



JOB No.: TCS00757/15

**DSD CONTRACT NO. DC/2013/09 –
ADVANCE WORKS FOR SHEK WU HUI SEWAGE
TREATMENT WORKS – FURTHER EXPANSION PHASE 1A
AND SEWERAGE WORKS AT PING CHE ROAD**

**34TH MONTHLY ENVIRONMENTAL MONITORING AND
AUDIT (EM&A) REPORT – JULY 2018**

PREPARED FOR

TSUN YIP WATERWORKS CONSTRUCTION CO LTD

Date	Reference No.	Prepared By	Certified By
9 August 2018	TCS00757/15/600/R0129v1	 Martin Li (Environmental Consultant)	 Tam Tak Wing (Environmental Team Leader)

Version	Date	Remarks
1	9 August 2018	First Submission

EXECUTIVE SUMMARY

ES.01 This is the 34th Monthly Environmental Monitoring and Audit Report covering the period from 1 to 31 July 2018 (the Reporting Period).

ENVIRONMENTAL MONITORING AND AUDIT ACTIVITIES

ES.02 Environmental monitoring activities under the EM&A program in this Reporting Period are summarized in the following table.

Issues	Environmental Monitoring Parameters / Inspection	Occasions
Air Quality	1-hour TSP	30
	24-hour TSP	10
Construction Noise	L _{Aeq(30min)} Daytime	8
Inspection / Audit	ET Regular Environmental Site Inspection	5
	IEC Monthly Environmental Site Audit	1

BREACH OF ACTION AND LIMIT (A/L) LEVELS

ES.03 No exceedance of air quality and construction noise monitoring were recorded in this Reporting Period. No Notification of Exceedance (NOE) was therefore issued. The statistics of environmental exceedance, NOE issued and investigation of exceedance are summarized in the following table.

Environmental Issues	Monitoring Parameters	Action Level	Limit Level	Event & Action		
				NOE Issued	Investigation	Corrective Actions
Air Quality	1-hour TSP	0	0	0	-	-
	24-hour TSP	0	0	0	-	-
Construction Noise	L _{Aeq(30min)}	0	0	0	-	-

Note: NOE – Notification of Exceedance

ENVIRONMENTAL COMPLAINT

ES.04 No environmental complaint was recorded or received in this Reporting Period. The statistics of environmental complaint are summarized in the following table.

Reporting Period	Environmental Complaint Statistics		
	Frequency	Cumulative	Complaint Nature
1 to 31 July 2018	0	0	NA

NOTIFICATION OF SUMMONS AND SUCCESSFUL PROSECUTIONS

ES.05 No environmental summons or successful prosecutions were recorded in this Reporting Period. The statistics of environmental complaint are summarized in the following tables.

Reporting Period	Environmental Summons Statistics		
	Frequency	Cumulative	Complaint Nature
1 to 31 July 2018	0	0	NA

Reporting Period	Environmental Prosecution Statistics		
	Frequency	Cumulative	Complaint Nature
1 to 31 July 2018	0	0	NA

REPORTING CHANGE

ES.06 There were no reporting changes in the Reporting Period.

SITE INSPECTION BY EXTERNAL PARTIES

ES.07 In the Reporting Period, joint site inspection to evaluate the site environmental performance by the RE, ET and the Contractor was carried out on 5, 12, 19, 26 and 31 July 2018. Furthermore, IEC attend site inspection was on 31 July 2018. No non-compliance was noted.

FUTURE KEY ISSUES

ES.08 Key issues to be considered in the coming month for the Contract include:

Major Construction Works	Potential Pollution Issues	Mitigation Measures
- Any remaining road reinstatement works and defect rectification works	- Potential dust impact for any works involves dusty material handling.	- Implement dust suppression measures during dusty material handling.

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1 INTRODUCTION

1.1 PROJECT BACKGROUND

- 1.1.1 The existing Shek Wu Hui Sewage Treatment Works (hereafter referred as “SWHSTW”) with secondary level treatment to sewage collected from Sheung Shui, Fanling and adjacent areas is operated and maintained by Drainage Services Department (hereafter referred as “DSD”). Based on the preliminary design of the Project, the scope of works for the Project comprises the following major components:
- (a) Demolition of the existing Inlet Works and construction of the new Inlet Works, including inlet pumping station, screening and degritting facilities;
 - (b) Demolition of 4 existing circular Primary Sedimentation Tanks (PSTs) and construction of new rectangular PSTs;
 - (c) Construction of new pre-membrane screens;
 - (d) Modification of existing Bioreactor (BR) 1 and 2 to suit the proposed membrane bioreactor (MBR) process;
 - (e) Construction of a new standby Bioreactor;
 - (f) Demolition of 4 existing circular Final Sedimentation Tanks (FSTs) and construction of new Membrane Tanks and Membrane Facility Building;
 - (g) Reconstruction of sludge treatment facilities, including thickening, anaerobic digestion, biogas handling, sludge holding and dewatering facilities; and
 - (h) Other ancillary works.
- 1.1.2 According to the Project implementation programme, the construction of most of the above proposed works (hereinafter referred to as “Main Works”) will be commencement in 2016 and completion in 2022. Furthermore, Advance Works as part of the above proposed works will carry out before Main Works commencement. The Advance Works will be commencement in third quarter of 2015 and comprise the following major components:
- (a) Modification of BR1, through upgrading of electrical and mechanical (E&M) equipment and minor civil works, to suit the proposed MBR process;
 - (b) Demolition of FSTs 1 and 2 and construction of Membrane Tanks and the first phase of Membrane Facility Building; and
 - (c) Tree felling and transplanting, to facilitate timely construction of the new Inlet Works during the implementation of Main Works (under review).
- 1.1.3 The general layout of Advance Works and Main Works of SWHSTW Further Expansion Phase 1A show in *Appendix A*. Subsequent to Further Expansion Phase 1A, the SWHSTW will be further expanded under separate projects (namely Further Expansion Phase 1B and Phase 2).
- 1.1.4 In July 2015, Tsun Yip Waterworks Construction Co Ltd (hereinafter referred as “Tsun Yip” or “the Contractor”) has awarded the DSD Contract No. DC/2013/09 – *Advance Works for Shek Wu Hui Sewage Treatment Works – Further Expansion Phase 1A and Sewerage Works at Ping Che Road* (hereinafter referred as “the Contract”). The Contract is the Advance Works for Shek Wu Hui Sewage Treatment Works as part of SWHSTW Further Expansion which is a Designated Project under Environmental Permit number FEP-02/474/2013 (hereinafter referred as “the FEP-02/474/2013” or “the EP”).
- 1.1.5 The works under the Contract at Shek Wu Hui Sewage Treatment Works will be included the conversion of one existing bioreactor and two existing final sedimentation tanks into one membrane bioreactor. Moreover, construction of about 1.5 kilometres length of sewers at Ping Che Road and other ancillary works will be undertaken. The works of Contract are scheduled to be conduct about 25 months. Layout plan of the Contract is shown in *Appendix B*.

- 1.1.6 Action-United Environmental Services & Consulting (hereinafter referred as “AUES”) was appointed by the Contractor as an Environmental Team (hereinafter referred as “the ET”) to implement the relevant EM&A program in accordance with the Updated EM&A Manual, as well as the associated duties.
- 1.1.7 As part of the EM&A program, baseline monitoring is required to determine the ambient environmental conditions. Hence baseline monitoring including air quality and noise were carried out between **28 August 2015** and **12 September 2015** at the proposed locations before construction work commencement. The “Baseline Monitoring Report (TCS00757/15/600/R0014 Version 2)” had submitted to EPD by the DSD before commencement of major construction works and approved by the IEC on 24 September 2015. Further to Tsun Yip’s instructions, the EM&A program was commenced on 1 October 2015 and the monitoring schedule had been issued to relevant parties on 29 September 2015.
- 1.1.8 This is the **34th** Monthly EM&A Report presenting the monitoring results and inspection findings for the reporting period from **1 to 31 July 2018**.

1.2 REPORT STRUCTURE

- 1.2.1 The Monthly Environmental Monitoring and Audit (EM&A) Report is structured into the following sections:-

SECTION 1	INTRODUCTION
SECTION 2	PROJECT ORGANIZATION AND CONSTRUCTION PROGRESS
SECTION 3	SUMMARY OF MONITORING REQUIREMENTS
SECTION 4	MONITORING METHODOLOGY
SECTION 5	IMPACT MONITORING RESULTS
SECTION 6	WASTE MANAGEMENT
SECTION 7	SITE INSPECTIONS
SECTION 8	ENVIRONMENTAL COMPLAINTS AND NON-COMPLIANCE
SECTION 9	IMPLEMENTATION STATUSES OF MITIGATION MEASURES
SECTION 10	CONCLUSIONS AND RECOMMENDATION

2 PROJECT ORGANIZATION AND CONSTRUCTION PROGRESS**2.1 PROJECT ORGANIZATION AND MANAGEMENT STRUCTURE**

2.1.1 Organization structure and contact details of relevant parties with respect to on-site environmental management are shown in *Appendix C*.

2.2 CONSTRUCTION PROGRESS

2.1.2 3-Month Rolling Programme of the Project is enclosed in *Appendix D* and the major construction activities undertaken in this Reporting Month are illustrated in *Appendix B* and listed below:-

- Reinstatement of Concrete Pavement

2.3 SUMMARY OF ENVIRONMENTAL SUBMISSIONS

2.1.3 Summary of the relevant permits, licences, and/or notifications on environmental protection for this Project in this Reporting Period is presented in *Table 2-1*.

Table 2-1 Status of Environmental Licenses and Permits

Item	Description	License/Permit Status
1	Air Pollution Control (Construction Dust) Regulation	Notified EPD on 30 July 2015
2	Chemical waste Producer Registration (WPN: 5213-624-T3148-04)	Application date: 19/08/2015 Date approved: 18/9/2015
3	Water Pollution Control Ordinance (Discharge License: WT00022503-2015)	Application date: 19/08/2015 Date approved: 18/9/2015
4	Billing Account for Disposal of Construction Waste (Account Number: 7022898)	Granted on 02/09/2015
5	Further Environmental Permit No. FEP-02/474/2013	Granted on 15/02/2018

2.1.4 In accordance with the Further EP No. FEP-02/474/2013 Condition 2.3, an Updated Environmental Monitoring and Audit (EM&A) Manual (TCS00757/15/600/R0012v3) which certified by the Environmental Team (ET) Leader and verified by the Independent Environmental Checker (IEC), has submitted to DSD and EPD endorsement.

2.1.5 Baseline Monitoring Report (TCS00757/15/600/R0014v2) as certified by the ETL and verified by the IEC was submitted to the EPD on 24 September 2015 for endorsement.

3 SUMMARY OF IMPACT MONITORING REQUIREMENT**3.1 GENERAL**

3.1.1 The Environmental Monitoring and Audit requirements are set out in the Updated EM&A manual. Environmental issues such as air quality and construction noise were identified as the key issues during the construction phase of Advance Works of the Project.

3.1.2 A summary of EM&A programme of construction phase are presented in the sub-sections below.

3.2 MONITORING PARAMETERS

3.2.1 The EM&A programme of construction phase shall cover the following environmental issues:

- Air quality; and
- Construction noise

3.2.2 A summary of the monitoring parameters is presented in *Table 3-1* below

Table 3-1 Summary of EM&A Requirements

Environmental Issue	Parameters
Air Quality	<ul style="list-style-type: none"> • 1-hour TSP by Real-Time Portable Dust Meter; and • 24-hour TSP by High Volume Air Sampler.
Construction Noise	<ul style="list-style-type: none"> • Leq_(30min) during normal working hours; and • Leq_(15min) for the construction works undertaken in Restricted Hours, if necessary.

3.3 MONITORING LOCATIONS

3.3.1 According to the *Updated EM&A Manual* of Advance Works which submitted to EPD on 25 August 2015, three air quality sensitive receivers and two construction noise sensitive receivers are proposed to monitor the environmental performance of the Contract. The proposed monitoring locations are summarized in *Table 3-2* and shown in *Appendix E*.

Table 3-2 Proposed Air Quality and Construction Noise Monitoring Locations

Aspect	Station ID	Location	Parameter
Air Quality	AM1	No. 31 Wai Loi Tsuen	1- hour and 24- hour TSP
	AM2	Fu Tei Au	1- hour
	AM2a	RE's Site Office	24- hour TSP
Noise	NM1	No. 31 Wai Loi Tsuen	L _{eq(30min)}
	NM2	Fu Tei Au	L _{eq(30min)}

3.4 MONITORING FREQUENCY AND PERIOD

3.4.1 The requirements of baseline monitoring are stipulated in *Sections 2.1.7 and 3.2.5* of the *Updated EM&A Manual* and presented as follows.

Air Quality Monitoring

3.4.2 Monitoring frequency for air quality baseline monitoring is as follows:

- 1-Hour TSP 3 sets of 1-hour TSP monitoring shall be carried out once in every six days.
- 24-Hour TSP 24-hour shall be carried out once in every six days.

Noise Monitoring

3.4.3 Construction noise monitoring should be carried out at the designated monitoring station when there are Project-related construction activities being undertaken within a radius of 300m from the monitoring stations. The monitoring frequency should depend on the scale of the construction activities. An initial guide on the monitoring is to obtain one set of 30-minute

measurement at each station between 0700 and 1900 hours on normal weekdays at a frequency of once a week when construction activities are underway.

- 3.4.4 If construction works are extended to include works during the hours of 1900 - 0700, additional weekly impact monitoring shall be carried out during evening and night-time works. Applicable permits under NCO shall be obtained by the Contractor.

3.5 MONITORING EQUIPMENT

Air Quality Monitoring

- 3.5.1 The 24-hour and 1-hour TSP levels shall be measured by following the standard high volume sampling method as set out in the *Title 40 of the Code of Federal Regulations, Chapter 1 (Part 50), Appendix B*. If the ET proposes to use a direct reading dust meter to measure 1-hour TSP levels, it shall submit sufficient information to the IEC to approve.
- 3.5.2 The filter paper of 24-hour TSP measurement shall be determined by HOKLAS accredited laboratory.
- 3.5.3 All equipment as used air quality monitoring is listed in *Table 3-3*.

Table 3-3 Air Quality Monitoring Equipment

Equipment	Model
<i>24-Hr TSP</i>	
High Volume Air Sampler	TISCH High Volume Air Sampler, HVS Model TE-5170
Calibration Kit	TISCH Model TE-5025A
<i>1-Hour TSP</i>	
Portable Dust Meter	Sibata LD-3B Laser Dust monitor Particle Mass Profiler & Counter

Wind Data Monitoring Equipment

- 3.5.4 According to the Updated EM&A Manual Sections 2.1.3.8, alternative methods to obtain representative wind data was proposed by the ET. Meteorological information as extracted from “the Hong Kong Observatory Ta Kwu Ling Station” is alternative method to obtain representative wind data. For Ta Kwu Ling Station, it is located nearby the Project site. Moreover, this station is situated the sea level above 15mPD. The station’s wind data monitoring equipment is set above the existing ground ten meters in compliance with the general setting up requirement. Furthermore, this station can also provide the humidity, rainfall, and air pressure and temperature etc. meteorological information. In a lot of Hong Kong development projects, weather information extracted from Hong Kong Observatory is a common alternative method if installation of weather station is not allowed.

Noise Monitoring

- 3.5.5 Sound level meter in compliance with the International Electrotechnical Commission Publications 651: 1979 (Type 1) and 804: 1985 (Type 1) specifications shall be used for carrying out the noise monitoring. The sound level meter shall be checked using an acoustic calibrator. The wind speed shall be checked with a portable wind speed meter capable of measuring the wind speed in $m s^{-1}$.
- 3.5.6 Noise monitoring equipment to be used for impact monitoring is listed in *Table 3-4*.

Table 3-4 Construction Noise Monitoring Equipment

Equipment	Model
Integrating Sound Level Meter	Rion NL - 52
Calibrator	B&K 4231
Portable Wind Speed Indicator	Testo Anemometer

- 3.5.7 Sound level meters listed above comply with the *International Electrotechnical Commission*

Publications 651: 1979 (Type 1) and 804: 1985 (Type 1) specifications, as recommended in TM issued under the NCO. The acoustic calibrator and sound level meter to be used in the baseline monitoring will be calibrated yearly.

3.6 DETERMINATION OF ACTION/LIMIT (A/L) LEVELS

3.6.1 According to the baseline monitoring results and the Updated EM&A Manual, the air quality and construction noise criteria were set up, namely Action and Limit levels are listed in *Tables 3-5 & 3-6* as below.

Table 3-5 Action and Limit Levels for 24-Hr TSP and 1-Hr TSP Air Quality, $\mu\text{g m}^{-3}$

Monitoring Stations	Action Level ($\mu\text{g/m}^3$)		Limit Level ($\mu\text{g/m}^3$)	
	1-hour	24-hour	1-hour	24-hour
AM1	286	147	500	260
AM2	276	NA	500	NA
AM2a	NA	155	NA	260

Table 3-6 Action and Limit Levels for Construction Noise

Monitoring Stations	Action Level	Limit Level in dB(A)
Time Period: 0700-1900 hours on normal weekdays		
NM1 and NM2	When one documented complaint is received	> 75* dB(A)

Note: (*) Reduces to 70 dB(A) for schools and 65 dB(A) during the school examination periods.

3.7 EVENT ACTION PLAN

3.7.1 If non-compliance or exceedance of the Action/Limit Levels is occurred, actions shall be taken in accordance with the Event Action Plan in *Appendix F*.

4 MONITORING METHDOLOGY

4.1 AIR QUALITY MONITORING

Monitoring Location

- 4.1.1 The detailed information of air quality monitoring stations referred to *Table 3-2* and the graphical plot of monitoring locations shown in *Appendix E* in this report.

Monitoring Equipment

- 4.1.2 All the monitoring equipment to be used in the EM&A program as listed in *Table 3-3* has been agreed with the IEC.

Monitoring Procedures

1-hour TSP

- 4.1.3 The 1-hour TSP monitor, a Sibata LD-3B Laser Dust monitor Particle Mass Profiler & Counter was used for baseline monitoring, which is a portable, battery-operated laser photometer. The 1-hour TSP meter provides a real time 1-hour TSP measurement based on 90⁰ light scattering. The 1-hour TSP monitor consisted 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 Windows based program to facilitate data collection, analysis and reporting.
- 4.1.4 The 1-hour TSP meter used is within the valid period, 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 was follow manufacturer's Operation and Service Manual. A valid calibration certificate is attached in *Appendix G*.

24-hour TSP

- 4.1.5 The equipment used for 24-hour TSP measurement is a Tisch Environmental, Inc. Model TE-5170 TSP high volume air sampling system, which complied with EPA Code of Federal Regulation, Appendix B to Part 50. The High Volume Air Sampler (HVS) consists of the following:
- An anodized aluminum shelter;
 - A 8"x10" stainless steel filter holder;
 - A blower motor assembly;
 - A continuous flow/pressure recorder;
 - A motor speed-voltage control/elapsed time indicator;
 - A 7-day mechanical timer, and
 - A power supply of 220v/50 hz
- 4.1.6 Prior to 24-hour TSP monitoring, the HVS was calibrated in accordance with the manufacturer's instruction using the NIST-certified standard calibrator (Tisch Calibration Kit Model TE-5025A). The 24-hour TSP Monitoring using the HVS was also processed in accordance with the manufacturer's Operations Manual. A valid calibration certificate of the calibration kit with the certificate of HVS calibrated is attached in *Appendix G*.
- 4.1.7 24-hour TSP was collected by the ET on filters of HVS and quantified by a local HOKLAS accredited laboratory, ALS Technichem (HK) Pty Ltd (ALS), upon receipt of the samples. The ET keeps all the sampled 24-hour TSP filters in normal air conditioned room conditions, i.e. 70% HR (Relative Humidity) and 25°C, for six months prior to disposal.

4.2 CONSTRUCTION NOISE MONITORING

Monitoring Location

- 4.2.1 The detailed information of construction noise monitoring stations referred to *Table 3-2* and the graphical plot of monitoring locations shown in *Appendix E* in this report.

Monitoring Equipment

- 4.2.2 All the monitoring equipment to be used in the EM&A program as listed in *Table 3-3* has been agreed with the IEC.
- 4.2.3 Sound level meter listed in *Table 3-4* is complied with the International Electrotechnical Commission Publications 651: 1979 (Type 1) and 804: 1985 (Type 1) specifications, as recommended in Technical Memorandum (TM) issued under the Noise Control Ordinance (NCO). A valid of calibration certificates including sound level meter and an acoustic were shown in *Appendix G*.

Monitoring Procedures

- 4.2.4 The noise measurement was performed with the meter set to FAST response and on the A-weighted equivalent continuous sound pressure level (Leq). Leq(30min) in six consecutive Leq(5 min) measurements were used as the monitoring parameter throughout the baseline monitoring period.
- 4.2.5 During the monitoring, the sound level meter was mounted on a tripod at a height of about 1.2 m and placed at the monitoring locations and oriented such that the microphone was pointed to the site with the microphone facing perpendicular to the line of sight. The windshield was fitted for the measurement. For construction noise monitoring, all monitoring stations were conducted 1 m from the exterior of the building façade.
- 4.2.6 Prior to 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. The calibration level from before and after the noise measurement agrees to within 1.0dB.
- 4.2.7 During the noise measurement, a portable wind speed meter was used to check wind speed (m/s). For impact noise monitoring, no wind speed was exceeding 5m/s or gusts exceeding 10m/s. Also, noise measurement in time was no fog and rain.

4.3 DATA MANAGEMENT AND DATA QA/QC CONTROL

- 4.3.1 The monitoring data were handled by the ET's in-house data recording and management system.
- 4.3.2 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 a computerized database properly maintained by the ET. The laboratory results were input directly into the computerized database and checked by personnel other than those who input the data.
- 4.3.3 For monitoring parameters that require laboratory analysis, the local laboratory shall follow the QA/QC requirements as set out under the HOKLAS scheme for the relevant laboratory tests.

5 IMPACT MONITORING RESULTS**5.1 GENERAL**

5.1.1 Air quality and construction noise monitoring scheduled in the Reporting Period is enclosed in *Appendix H* and the monitoring results are shown in the following sub-sections.

5.2 RESULTS OF AIR QUALITY MONITORING

5.2.1 The results for 24-hour and 1-hour TSP are summarized in *Tables 5-1 to 5-2*. The 24-hour TSP data are shown in *Appendix I* and graph plots including 1-hour TSP and 24-hour TSP are shown in *Appendix J*.

Table 5-1 Summary of 1-Hour TSP Monitoring Results, $\mu\text{g}/\text{m}^3$

DATE	AM1				AM2			
	Start Time	1 st Meas.	2 nd Meas.	3 rd Meas.	Start Time	1 st Meas.	2 nd Meas.	3 rd Meas.
5-Jul-18	9:37	41	43	45	13:10	47	51	55
11-Jul-18	9:30	64	57	62	9:42	50	48	54
17-Jul-18	9:07	29	31	30	9:18	35	40	26
23-Jul-18	9:10	65	84	42	9:20	69	101	34
28-Jul-18	9:17	35	32	32	13:35	34	29	29
Average (Range)	46 (29 - 84)				47 (26 - 101)			

Table 5-2 Summary of 24-hour TSP Monitoring Results, $\mu\text{g}/\text{m}^3$

Date	AM1	AM2a
6-Jul-18	24	32
12-Jul-18	11	25
18-Jul-18	20	23
24-Jul-18	36	39
30-Jul-18	22	19
Average (Range)	22 (11 - 36)	28 (19-39)

5.2.2 As shown in *Tables 5-1* and *5-2*, the 24-hour and 1-hour TSP monitoring results were below the Action/ Limit Level. No Notification of Exceedances (NOE) of air quality criteria or corrective action was therefore required.

5.2.3 The meteorological data during the Reporting Month is summarized in *Appendix K*.

5.2.4 Construction dust assessment for short term impact was undertaken in the EIA study. In view of the current contract, monitoring locations AM1 and AM2a are not an ASR during the EIA study and therefore no prediction was made. For 1-hour TSP monitoring location AM2, it is very near the assessment point FLN-E13 in the EIA. According to the EIA prediction, the predicted result for Tier 2 in assessment year 2018 is $91.0\mu\text{g}/\text{m}^3$ for 1-hour TSP and the cumulative 1-hour concentrations would comply with the respective criteria and adverse short-term construction dust impact is not anticipated. It is concluded that the overall 1-hour TSP monitoring result in the Reporting Period is comparable to the EIA prediction.

5.3 RESULTS OF CONSTRUCTION NOISE MONITORING

5.3.1 In the Reporting Period, a total of 8 event noise measurements were carried out at the two designated locations. During construction noise monitoring, the sound level meter was set in 1m from the exterior of the building façade. Therefore, no façade correction (+3dB(A)) is added according to acoustical principles and EPD guidelines. The construction noise monitoring results at the designated locations are summarized in **Table 5-3**. The detailed noise monitoring data are presented in **Appendix I** and the relevant graphical plots are shown in **Appendix J**.

Table 5-3 Summary of Construction Noise Monitoring Results, dB(A)

Date	NM1		NM2	
	Time of Measurement	($L_{eq30min}$)	Time of Measurement	($L_{eq30min}$)
5-Jul-18	11:21	53	13:26	57
11-Jul-18	10:00	62	10:38	59
17-Jul-18	11:12	58	10:36	63
23-Jul-18	9:38	61	10:15	60
Limit Level	75 dB(A)			

5.3.2 As shown in **Table 5-3**, the noise level measured at the designated monitoring locations are well below 75dB(A). Furthermore, there was no noise complaints (Action Level exceedance) received by the RE, Contractors or DSD in the Reporting Period. Therefore, no Action or Limit Level exceedance was triggered and no corrective action was required.

6 WASTE MANAGEMENT

6.1 GENERAL WASTE MANAGEMENT

6.1.1 Waste management was carried out by an on-site Environmental Officer or an Environmental Supervisor from time to time.

6.2 RECORDS OF WASTE QUANTITIES

6.2.1 All types of waste arising from the construction work are classified into the following:

- Construction & Demolition (C&D) Material;
- Chemical Waste;
- General Refuse; and
- Excavated Soil.

6.2.2 The quantities of waste for disposal in this Reporting Period are summarized in *Tables 6-1* and *6-2* and the Monthly Summary Waste Flow Table is shown in *Appendix L*. Whenever possible, materials were reused on-site as far as practicable.

Table 6-1 Summary of Quantities of Inert C&D Materials for the Project

Type of Waste	Quantity			Disposal Location
	Prior Months	Reporting Month	Cumulated	
Total C&D Materials (Inert) (in '000m ³)	22.36	0.76	23.12	Tuen Mun 38
Hard Rock and Large Broken Concrete (Inert) (in '000 m ³)	2.24	0.01	2.25	Tuen Mun 38
Reused in this Project (Inert) (in '000 m ³)	3.47	0.00	3.47	--
Reused in other Projects (Inert) (in '000 m ³)	2.23	0.00	2.23	--
Disposal as Public Fill (Inert) (in '000 m ³)	14.52	0.75	15.27	Tuen Mun 38

Remark: The figures were rounded off to two decimal places.

Table 6-2 Summary of Quantities of C&D Wastes for the Project

Type of Waste	Quantity			Disposal Location
	Prior Months	Reporting Month	Cumulated	
Metals ('000kg)	142.00	0.00	142.00	--
Paper / Cardboard Packing ('000kg)	0.07	0.00	0.07	--
Plastics ('000kg)	0.00	0.00	0.00	--
Chemical Wastes ('000kg)	0.00	0.00	0.00	--
General Refuses ('000m ³)	1.11	0.03	1.14	NENT

Remark: The figures were rounded off to two decimal places.

7 SITE INSPECTION**7.1 REQUIREMENTS**

7.1.1 According to the Updated EM&A Manual, the environmental site inspection shall be formulated by ET Leader. Weekly environmental site inspections should carry out to confirm the environmental performance.

7.2 FINDINGS / DEFICIENCIES DURING THE REPORTING MONTH

7.2.1 In the Reporting Period, joint site inspection to evaluate the site environmental performance by the RE, ET and the Contractor has been carried out on **5, 12, 19, 26 and 31 July 2018**. Furthermore, IEC attend site inspection was on **31 July 2018**. No non-compliance was noted.

7.2.2 Observations for the site inspections and monthly audit within this Reporting Period are summarized in *Table 7-1*.

Table 7-1 Site Observations

Date	Findings / Deficiencies	Follow-Up Status
05 July 2018	<ul style="list-style-type: none"> No adverse environmental issues were observed. 	<ul style="list-style-type: none"> NA
12 July 2018	<ul style="list-style-type: none"> Dry haul road was observed. The Contractor should spray water regularly to avoid dust emission 	<ul style="list-style-type: none"> Water Spraying was implemented within site area.
19 July 2018	<ul style="list-style-type: none"> No adverse environmental issues were observed. 	<ul style="list-style-type: none"> NA
26 July 2018	<ul style="list-style-type: none"> The Contractor was reminded to remove stagnant water regularly to prevent mosquito breeding. The Contractor was reminded to clean the debris regularly. 	<ul style="list-style-type: none"> Not required for reminder.
31 July 2018	<ul style="list-style-type: none"> Dry unpaved haul road was observed. The Contractor was advised to spray water regularly for dust suppression. The Contractor was reminded to dispose wastes regularly at main building. 	<ul style="list-style-type: none"> To be follow-up in next reporting period.

7.2.3 In the Reporting Period, the overall environmental performance was considered satisfactory.

8 ENVIRONMENTAL COMPLAINT AND NON-COMPLIANCE**8.1 ENVIRONMENTAL COMPLAINT, SUMMONS AND PROSECUTION**

- 8.1.1 No environmental complaint, summons and prosecution was received in this reporting period. The statistical summary table of environmental complaint is presented in *Tables 8-1, 8-2 and 8-3*.

Table 8-1 Statistical Summary of Environmental Complaints

Reporting Period	Environmental Complaint Statistics		
	Frequency	Cumulative	Complaint Nature
1 to 31 July 2018	0	0	NA

Table 8-2 Statistical Summary of Environmental Summons

Reporting Period	Environmental Summons Statistics		
	Frequency	Cumulative	Complaint Nature
1 to 31 July 2018	0	0	NA

Table 8-3 Statistical Summary of Environmental Prosecution

Reporting Period	Environmental Prosecution Statistics		
	Frequency	Cumulative	Complaint Nature
1 to 31 July 2018	0	0	NA

9 IMPLEMENTATION STATUS OF MITIGATION MEASURES**9.1 GENERAL REQUIREMENTS**

9.1.1 The environmental mitigation measures that recommended in the Implementation Schedule for Environmental Mitigation Measures (ISEMM) in the Updated EM&A Manual covered the issues of dust, noise, water and waste and they are summarized presented in *Appendix M*.

9.1.2 The Contract under the Project shall be implementing the required environmental mitigation measures according to the Updated EM&A Manual as subject to the site condition. Environmental mitigation measures generally implemented by the Contract in this Reporting Period are summarized in *Table 9-1*.

Table 9-1 Environmental Mitigation Measures

Issues	Environmental Mitigation Measures
Water Quality	<ul style="list-style-type: none"> Wastewater to be treated by the filtration systems i.e. sedimentation tank before to discharge.
Air Quality	<ul style="list-style-type: none"> Maintain wet surface on access road All vehicles must be used wheel washing facility before off site Spray water during breaking works A cleaning truck was regularly performed on the public road to prevent fugitive dust emission
Noise	<ul style="list-style-type: none"> Restrain operation time of plants from 07:00 to 19:00 on any working day except for Public Holiday and Sunday. Keep good maintenance of plants Shut down the plants when not in used.
Waste and Chemical Management	<ul style="list-style-type: none"> On-site sorting prior to disposal Follow requirements and procedures of the “Trip-ticket System” Predict required quantity of concrete accurately Collect the unused fresh concrete at designated locations in the sites for subsequent disposal
General	<ul style="list-style-type: none"> The site was generally kept tidy and clean.

9.1.3 Based on monitoring results including air quality and construction noise, it is considered that the environmental mitigation measures implemented by the Contractor in this Reporting Period are effective.

9.2 TENTATIVE CONSTRUCTION ACTIVITIES IN THE COMING MONTH

9.2.1 Construction activities listed below will be undertaken in the coming month for the Contract of the Project.

- Defect rectification works

9.3 KEY ISSUES FOR THE COMING MONTH

9.3.1 Key issues to be considered in the coming month for the Contract include:

Major Construction Works	Potential Pollution Issues	Mitigation Measures
- Any remaining road reinstatement works and defect rectification works	- Potential dust impact for any works involves dusty material handling.	- Implement dust suppression measures during dusty material handling.

10 CONCLUSIONS AND RECOMMENTATIONS

10.1 CONCLUSIONS

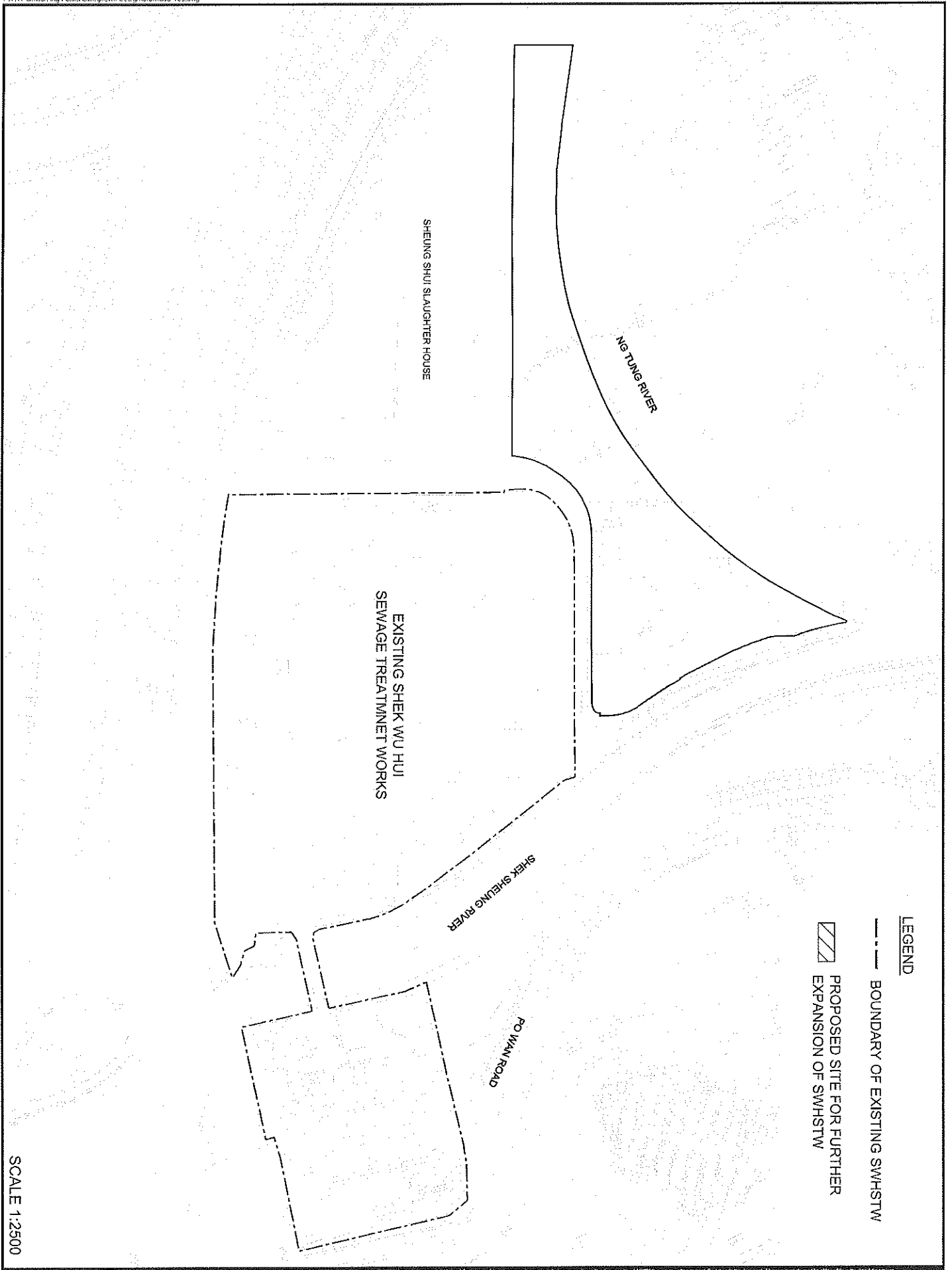
- 10.1.1 This is the 34th Monthly EM&A report, covering the construction period from **1 to 31 July 2018**.
- 10.1.2 No 24-hour or 1-hour TSP monitoring results that triggered the Action or Limit Levels were recorded. No NOEs or the associated corrective actions were therefore issued.
- 10.1.3 No noise complaint (which is an Action Level exceedance) was received and no construction noise measurement results that exceeded the Limit Level were recorded in this Reporting Period. No NOEs or the associated corrective actions were therefore issued.
- 10.1.4 No documented complaint, notification of summons or successful prosecution was received.
- 10.1.5 In the Reporting Period, joint site inspection to evaluate the site environmental performance by the RE, ET and the Contractor was carried out on **5, 12, 19, 26 and 31 July 2018**. Furthermore, IEC attend site inspection was on **31 July 2018**. No non-compliance was noted.

10.2 RECOMMENDATIONS

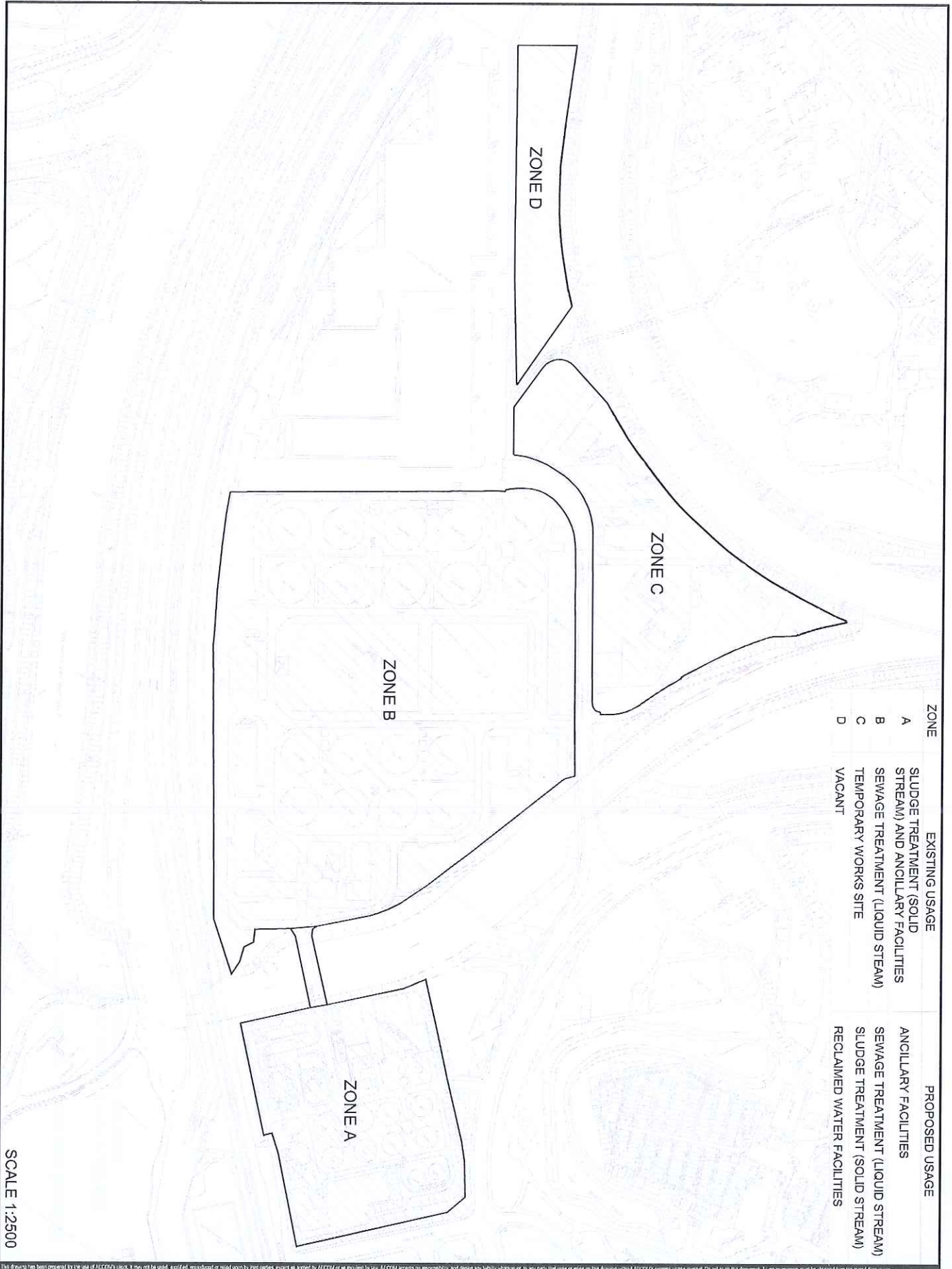
- 10.2.1 As wet season is approached, special attention should be paid to avoid ingress of surface runoff into nearby water bodies from the construction site. Water quality mitigation measures should be fully implemented.
- 10.2.2 Moreover, air quality mitigation measures including wheel wash facilities, watering of haul roads and covering of dusty materials with tarpaulin sheet, etc. should be properly maintained.
- 10.2.3 To control the site performance on waste management, Tsun Yip 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. Tsun Yip is also reminded to implement the recommended environmental mitigation measures according to the Updating Environmental Monitoring and Audit Manual.

Appendix A

GENERAL LAYOUT OF ADVANCE WORKS AND MAIN WORKS OF SWHSTW FURTHER EXPANSION PHASE 1A



SCALE 1:2500



SCALE 1:2500

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AGREEMENT NO. CE 40/2012 (DS)
 SHEK WU HUI SEWAGE TREATMENT WORKS
 - FURTHER EXPANSION PHASE 1A
 - INVESTIGATION

PREFERRED SITE UTILIZATION
 ACCORDING TO BRIEF



Project No.: 60284037 Date: FEB. 2014

Drawing 60284037/EM&AM/401

Appendix B

LAYOUT PLAN OF ADVANCE WORKS

NOTES

1. ALL CROSS SECTIONS TO BE DRAWN AND CHECKED.
2. THE CONTRACTOR'S ESTIMATION IS SHOWN TO BE THE RESPONSIBILITY OF THE CONTRACTOR FOR THE WORKS IN THE PRESENCE OF THIS PLAN.
3. PORTION A - AS SHOWN IN THE DRAWING, THE CONTRACTOR'S ESTIMATION IS SHOWN TO BE THE RESPONSIBILITY OF THE CONTRACTOR FOR THE WORKS IN THE PRESENCE OF THIS PLAN.
4. THE CONTRACTOR'S ESTIMATION IS SHOWN TO BE THE RESPONSIBILITY OF THE CONTRACTOR FOR THE WORKS IN THE PRESENCE OF THIS PLAN.
5. CROSS SECTIONS TO BE DRAWN AND CHECKED.

LEGEND

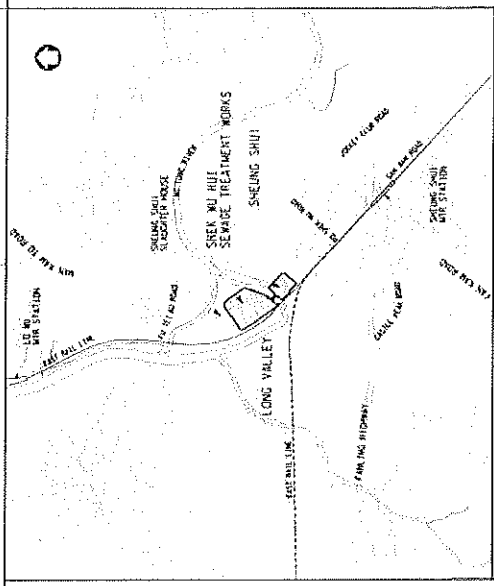
- WITH BOARDING
- NEW 150mm DIA. PIPE
- EXISTING STRUCTURE TO BE DEMOLISHED
- EXISTING STRUCTURE TO BE REPAIR
- PROPOSED STRUCTURE

SECTION 4 OF THE SITE

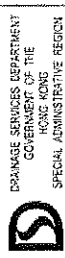
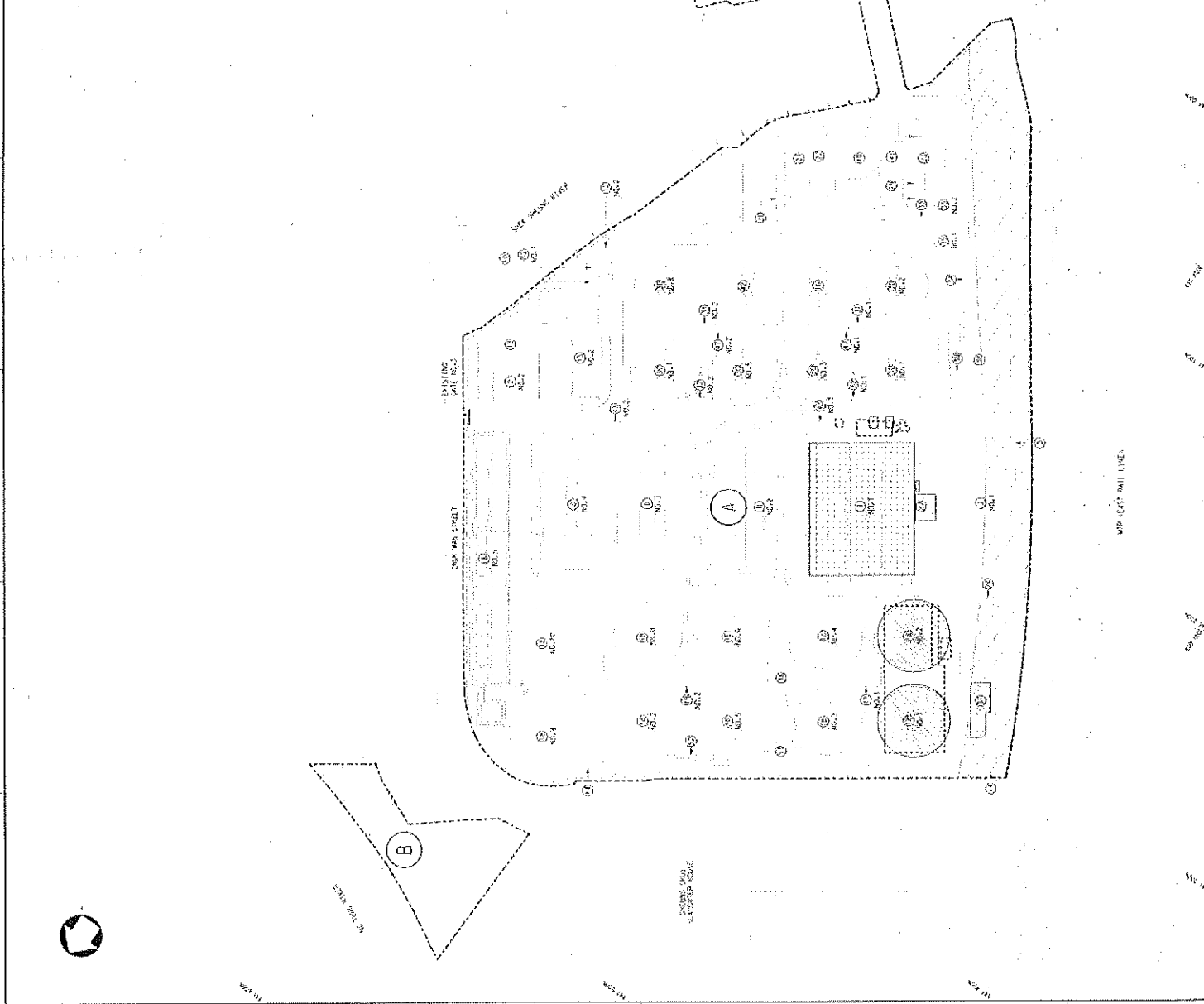
DATE	15/08/2013
DESIGNED BY	JP
CHECKED BY	JP
APPROVED BY	JP
PROJECT NO.	DC2013/09
PROJECT NAME	SEWERAGE WORKS AT PING CHE ROAD
CLIENT	DRAGONAR
SCALE	AS SHOWN

ADVANCE WORKS FOR SHER KU HUI
 FURTHER EXPANSION PHASE 1A AND
 SEWERAGE WORKS AT PING CHE ROAD

DRAGONAR
 PROJECT NO. DC2013/09
 PROJECT NAME SEWERAGE WORKS AT PING CHE ROAD
 CLIENT DRAGONAR
 SCALE AS SHOWN



KEY PLAN
 SCALE 1:2,500



SEWERAGE PROJECTS DIVISION

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DSP/DC1309/11021

NOTES:

1. ALL DIMENSIONS ARE TO CENTER LINE UNLESS OTHERWISE SPECIFIED.
2. THE CONTRACTOR SHALL VERIFY ALL DIMENSIONS AND LOCATIONS OF EXISTING UTILITIES AND STRUCTURES PRIOR TO COMMENCEMENT OF WORKS IN THE VICINITY OF THIS SITE.
3. THE CONTRACTOR SHALL VERIFY THE EXISTING UTILITIES AND STRUCTURES PRIOR TO COMMENCEMENT OF WORKS IN THE VICINITY OF THIS SITE.
4. THE CONTRACTOR SHALL VERIFY THE EXISTING UTILITIES AND STRUCTURES PRIOR TO COMMENCEMENT OF WORKS IN THE VICINITY OF THIS SITE.
5. THE CONTRACTOR SHALL VERIFY THE EXISTING UTILITIES AND STRUCTURES PRIOR TO COMMENCEMENT OF WORKS IN THE VICINITY OF THIS SITE.

LEGEND :

- SITE BOUNDARY
- EXISTING STRUCTURE TO BE DEMOLISHED
- EXISTING STRUCTURE TO BE MODIFIED
- PROPOSED STRUCTURE
- PORTION A OF THE SITE

FOR TENDER PURPOSES ONLY

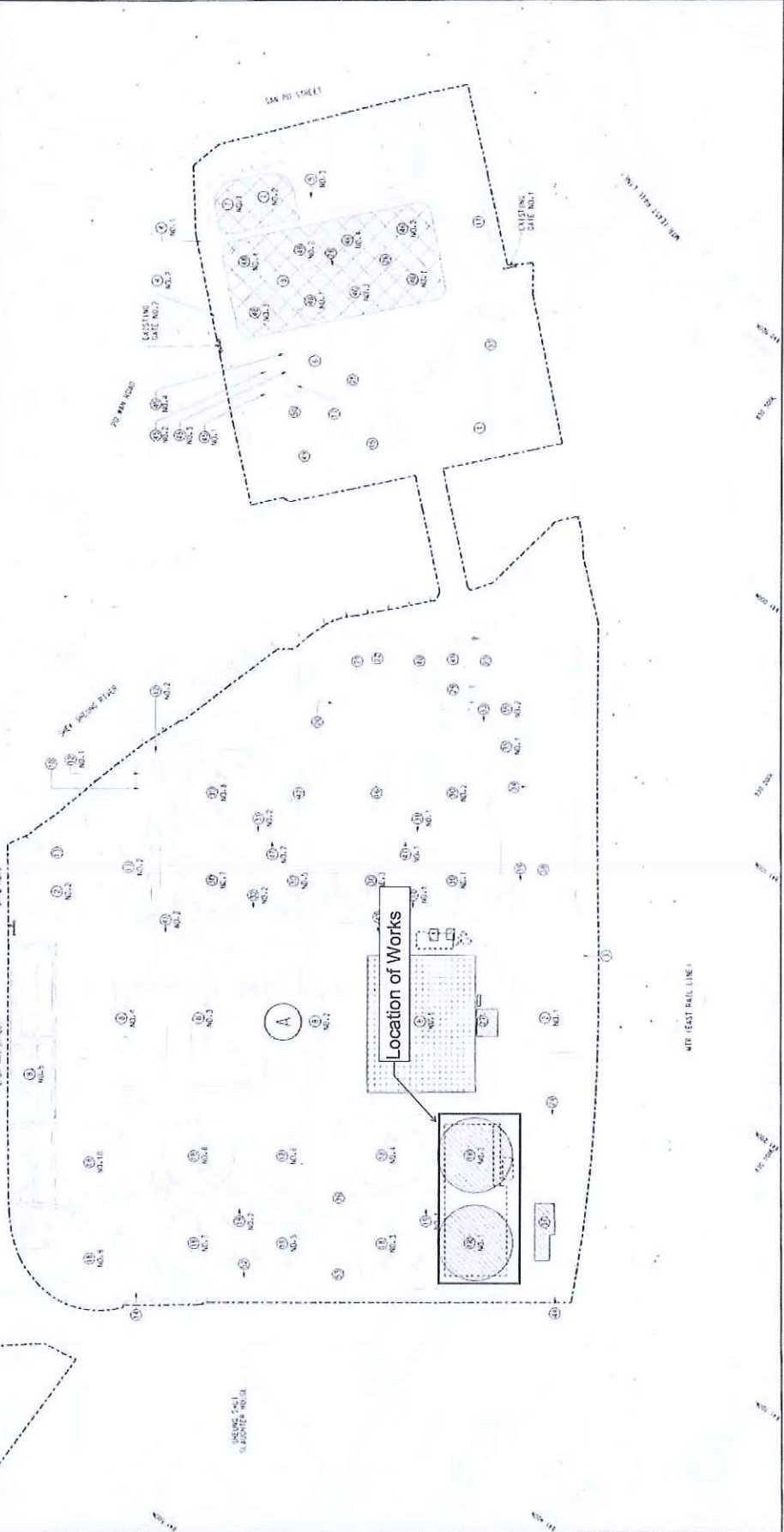
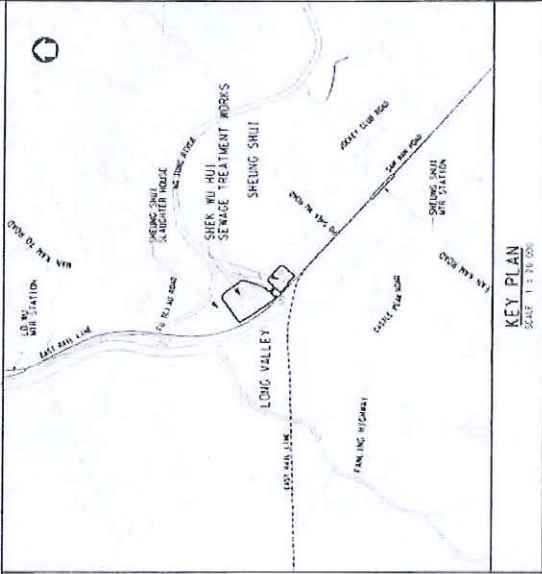
NO.	REVISION	DATE	BY	CHKD.
1	ISSUED FOR TENDER	12 DEC 2014		
2	REVISED	13 DEC 2014		
3	REVISED	13 DEC 2014		
4	REVISED	13 DEC 2014		
5	REVISED	13 DEC 2014		

DRAWN BY: [Name]
 CHECKED BY: [Name]
 DATE: 12 DEC 2014
 PROJECT NO: 4388DS
 CONTRACT: [Name]

ADVANCE WORKS FOR SHEK WU HUI
 SEWAGE TREATMENT WORKS -
 FURTHER EXPANSION PHASE 1A AND
 SEWERAGE WORKS AT PING CHE ROAD

DRAWING NO: [Number]
 SHEET NO: 11 OF 11
 PROJECT NO: DSP/DC1309/11021A
 CONTRACT NO: [Number]
 DRAWING DATE: [Date]

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 SEWERAGE PROJECTS DIVISION
 DRAINAGE SERVICES DEPARTMENT
 GOVERNMENT OF THE HONG KONG SPECIAL ADMINISTRATIVE REGION



SHEK WU HUI SEWAGE TREATMENT WORKS - FURTHER EXPANSION PHASE 1A AND SEWERAGE WORKS AT PING CHE ROAD
 SHEET NO. 11 OF 11
 PROJECT NO. DSP/DC1309/11021A
 CONTRACT NO. [Number]

Appendix C

ORGANIZATION STRUCTURE AND CONTACT DETAILS OF RELEVANT PARTIES



Tsun Yip Waterworks Construction Company Limited 進業水務建築有限公司

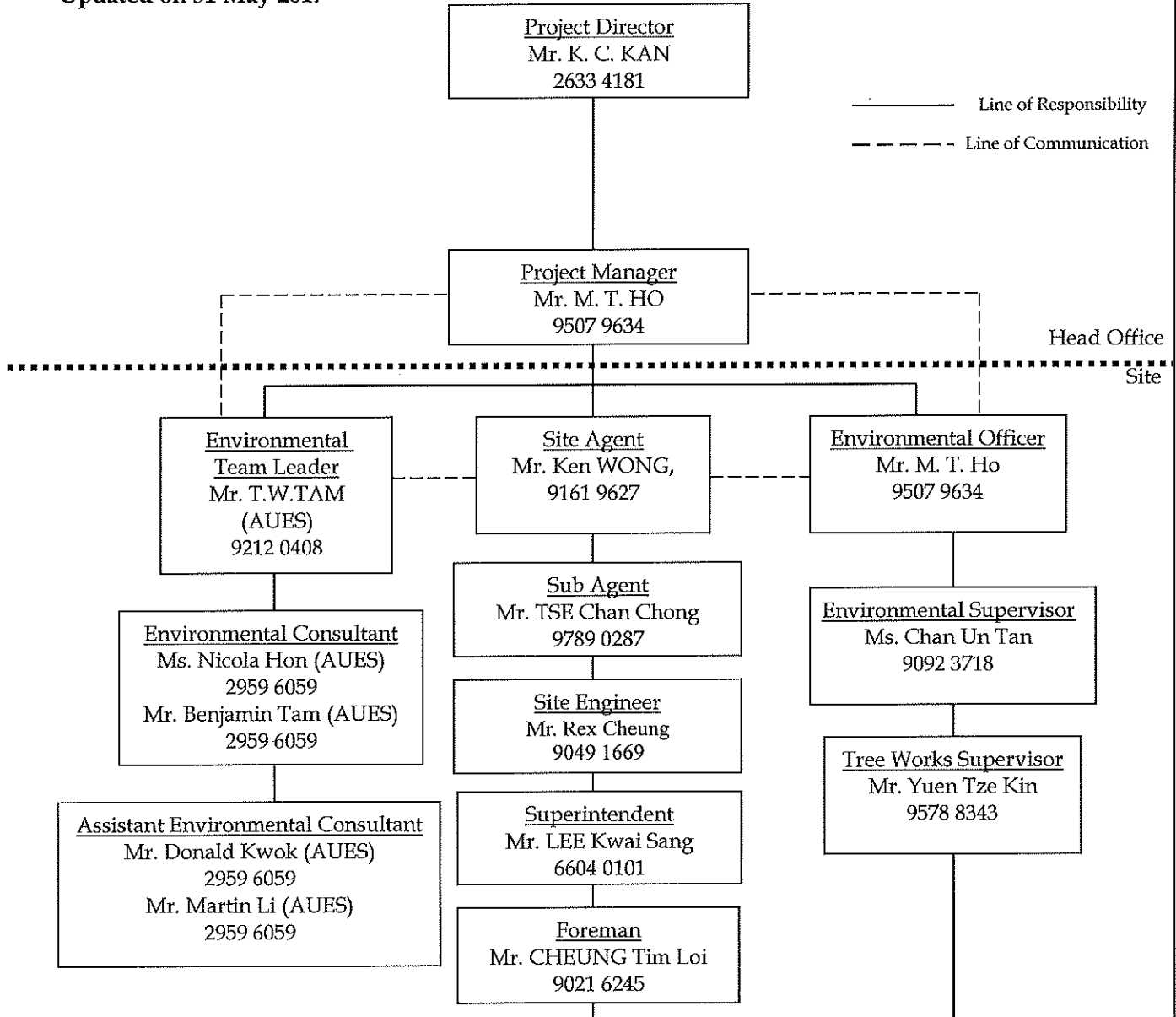
Contract No. DC/2013/09

Advance Works for Shek Wu Hui Sewage Treatment Works

- Further Expansion Phase 1A and Sewerage Works at Ping Che Road

SITE ENVIRONMENTAL TEAM ORGANIZATION CHART

Updated on 31 May 2017



Site Environmental Representatives of Sub-contractors / Sub-subcontractors

<u>Pegasus Greenland Ltd.</u> TBC	<u>Luen Fai Steel Engineering Co., Ltd</u> Mr. H. F. Mak 9130 6038	<u>Long Wei Engineering Co., Ltd.</u> Mr. Tsang Kui Man 5435 9923	<u>Fibrpro International Ltd. (FRP)</u> Mr. WONG Ngan Hoi 6016-8834
<u>Hills Construction Ltd. (Formwork & Concreting)</u> Mr. WONG Siu Fai 6703-2443	<u>Hung Cheuk Construction Ltd. (Bar Fixing)</u> Mr. TAM Chi Kwan 6238-7875	<u>Chun Hung Engineering Ltd. (Welding)</u> Mr. W. C. Kwong 6686 4939	

Contact Details of Relevant Parties

Organization	Project Role	Name of Key Staff	Tel No.	Fax No.
DSD	Resident Site Engineer	Ms. Konica Cheung	2759 2601	2827 8700
ANewR	Independent Environmental Checker	Mr. Adi Lee	2618 2836	3007 8648
Tsun Yip	Project Director	Mr. K. C. KAN	2633 4181	2633 4691
Tsun Yip	Project Manager	Mr. M. T. HO	9507 9634	2633 4691
Tsun Yip	Site Agent	Mr. Ken WONG	9161 9627	2633 4691
Tsun Yip	Environmental Officer	Mr. M.T.HO	9507 9634	2633 4691
AUES	Environmental Team Leader	Mr. T. W. Tam	2959 6059	2959 6079
AUES	Environmental Consultant	Ms. Nicola Hon	2959 6059	2959 6079
AUES	Environmental Consultant	Mr. Ben Tam	2959 6059	2959 6079
AUES	Assistant Environmental Consultant	Mr. Martin Li	2959 6059	2959 6079

Legend:

DSD (Employer & Resident Site Engineer) – Drainage Service Department

Tsun Yip (Main Contractor) – Tsun Yip Waterworks Construction Co Ltd

ANEWR (IEC) – ANEWR Consulting Limited

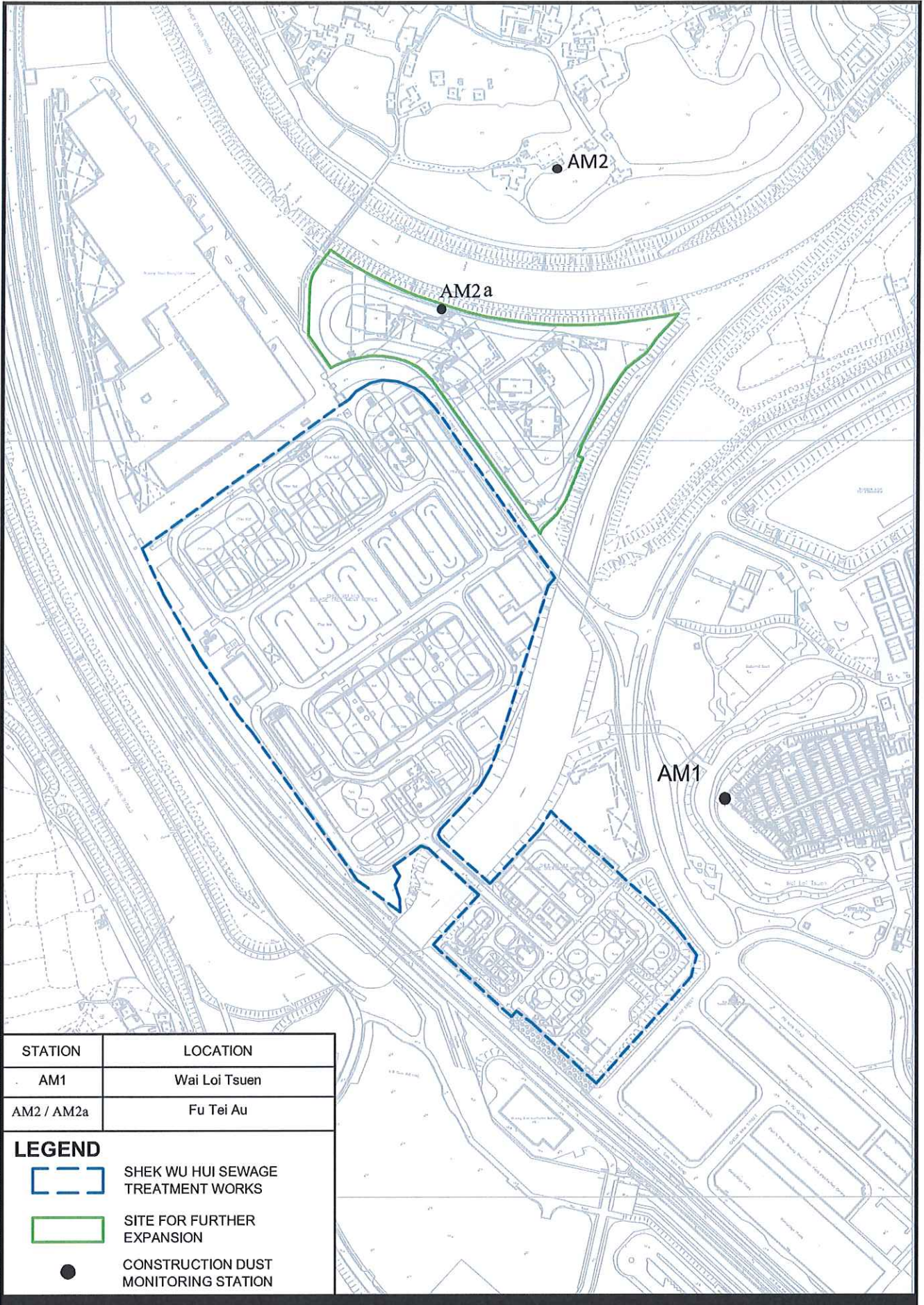
AUES (ET) – Action-United Environmental Services & Consulting

Appendix D

3-MONTH ROLLING PROGRAM

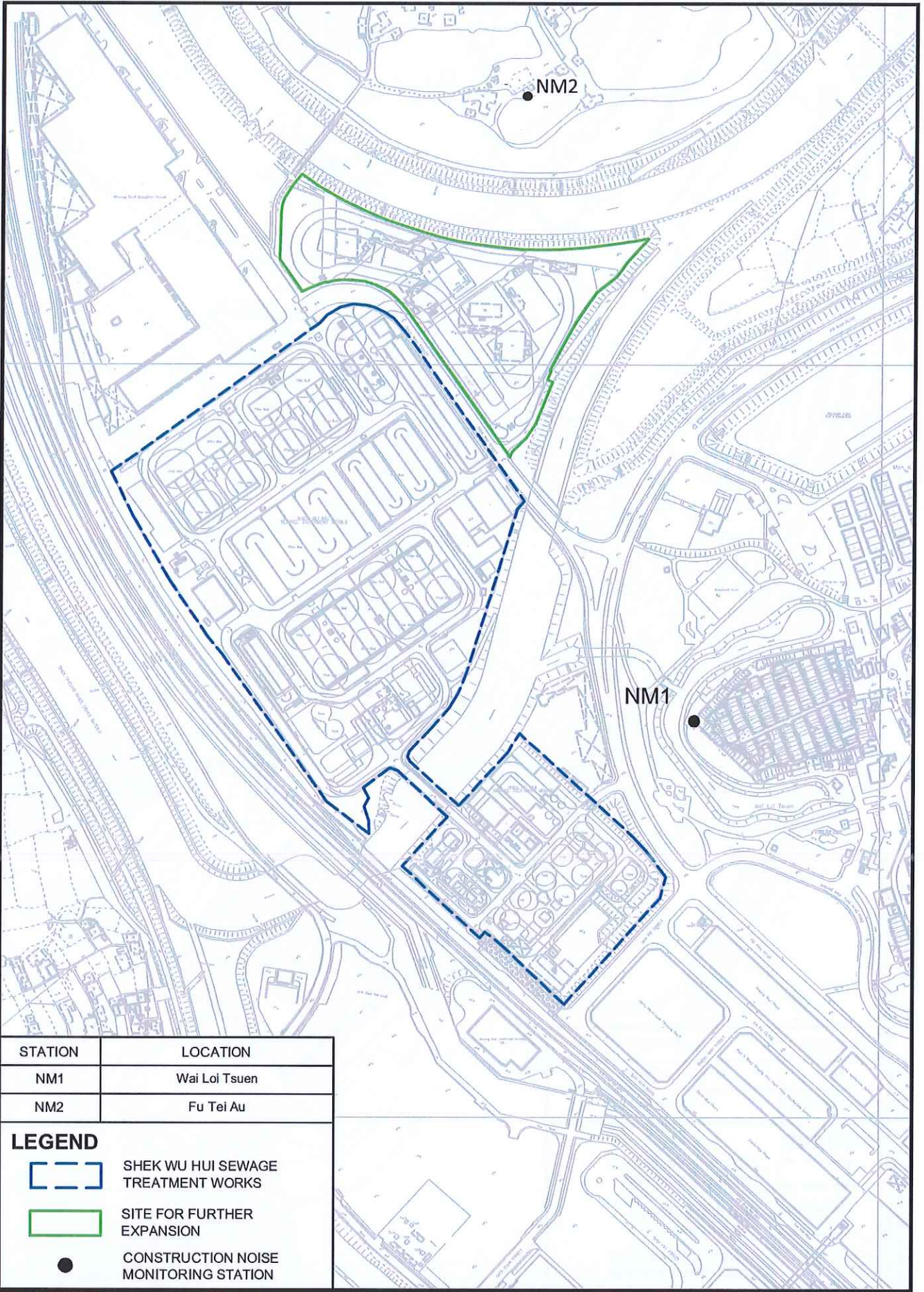
Appendix E

PROPOSED MONITORING LOCATIONS



STATION	LOCATION
AM1	Wai Loi Tsuen
AM2 / AM2a	Fu Tei Au

LEGEND	
	SHEK WU HUI SEWAGE TREATMENT WORKS
	SITE FOR FURTHER EXPANSION
	CONSTRUCTION DUST MONITORING STATION



STATION	LOCATION
NM1	Wai Loi Tsuen
NM2	Fu Tei Au

LEGEND	
	SHEK WU HUI SEWAGE TREATMENT WORKS
	SITE FOR FURTHER EXPANSION
	CONSTRUCTION NOISE MONITORING STATION

AGREEMENT NO. CE 40/2012 (DS)
SHEK WU HUI SEWAGE TREATMENT WORKS
- FURTHER EXPANSION PHASE 1A
- INVESTIGATION

LOCATIONS OF CONSTRUCTION NOISE MONITORING STATIONS



Appendix F

EVENT ACTION PLAN

Event and Action Plan for Construction Dust

Event	Action				Contractor
	ET	IEC	ER	Contractor	
Action level being exceeded by one sampling	<ol style="list-style-type: none"> Identify source, investigate the causes of complaint and propose remedial measures; Inform IEC and ER; Repeat measurement to confirm findings; Increase monitoring frequency to daily. 	<ol style="list-style-type: none"> Check monitoring data submitted by ET; Check Contractor's working method. 	<ol style="list-style-type: none"> Notify Contractor. 	<ol style="list-style-type: none"> Rectify any unacceptable practice; Amend working methods if appropriate. 	
Action level being exceeded by two or more consecutive sampling	<ol style="list-style-type: none"> Identify source; Inform IEC and ER; Advise the ER on the effectiveness of the proposed remedial measures; Repeat measurements to confirm findings; Increase monitoring frequency to daily; Discuss with IEC and Contractor on remedial actions required; If exceedance continues, arrange meeting with IEC and ER; If exceedance stops, cease additional monitoring. 	<ol style="list-style-type: none"> Check monitoring data submitted by ET; Check Contractor's working method; Discuss with ET and Contractor on possible remedial measures; Advise the ET on the effectiveness of the proposed remedial measures; Supervise Implementation of remedial measures. 	<ol style="list-style-type: none"> Confirm receipt of notification of exceedance in writing; Notify Contractor; Ensure remedial measures properly implemented. 	<ol style="list-style-type: none"> Submit proposals for remedial actions to IEC within three working days of notification; Implement the agreed proposals; Amend proposal if appropriate. 	
Limit level being exceeded by one sampling	<ol style="list-style-type: none"> Identify source, investigate the causes of exceedance and propose remedial measures; Inform Contractor, IEC, ER, and EPD; Repeat measurement to confirm finding; Increase monitoring frequency to daily; Assess effectiveness of Contractor's remedial actions and keep IEC, EPD and ER informed of the results. 	<ol style="list-style-type: none"> Check monitoring data submitted by ET; Check Contractor's working method; Discuss with ET and Contractor on possible remedial measures; Advise the ER on the effectiveness of the proposed remedial measures; Supervise implementation of remedial measures. 	<ol style="list-style-type: none"> Confirm receipt of notification of exceedance in writing; Notify Contractor; Ensure remedial measures properly implemented. 	<ol style="list-style-type: none"> Take immediate action to avoid further exceedance; Submit proposals for remedial actions to IEC within three working days of notification; Implement the agreed proposals; Amend proposal if appropriate. 	
Limit level being exceeded by two or more consecutive sampling	<ol style="list-style-type: none"> Notify IEC, ER, Contractor and EPD; Identify source; Repeat measurement to confirm findings; Increase monitoring frequency to daily; Carry out analysis of Contractor's working procedures to determine possible mitigation to be implemented; Arrange meeting with IEC and ER to discuss the remedial actions to be taken; Assess effectiveness of Contractor's remedial actions and keep IEC, EPD and ER informed of the results; If exceedance stops, cease additional monitoring. 	<ol style="list-style-type: none"> Discuss amongst ER, ET, and Contractor on the potential remedial actions; Review Contractor's remedial actions whenever necessary to assure their effectiveness and advise the ER accordingly; Supervise the implementation of remedial measures. 	<ol style="list-style-type: none"> Confirm receipt of notification of exceedance in writing; Notify Contractor; In consolidation with the IEC, agree measures to be implemented; Ensure remedial measures properly implemented; If exceedance continues, consider what portion of the work is responsible and instruct the Contractor to stop that portion of work until the exceedance is abated. 	<ol style="list-style-type: none"> Take immediate action to avoid further exceedance; Submit proposals for remedial actions to IEC within three working days of notification; Implement the agreed proposals; Resubmit proposals if problem still not under control; Stop the relevant portion of works as determined by the ER until the exceedance is abated. 	

Event and Action Plan for Construction Noise

Event	Action			
	ET	IEC	ER	Contractor
Action Level	<ol style="list-style-type: none"> 1. Notify IEC and Contractor; 2. Carry out investigation; 3. Report the results of investigation to the IEC, ER and Contractor; 4. Discuss with the Contractor and formulate remedial measures; 5. Increase monitoring frequency to check mitigation effectiveness. 	<ol style="list-style-type: none"> 1. Review the analysed results submitted by the ET; 2. Review the proposed remedial measures by the Contractor and advise the ER accordingly; 3. Supervise the implementation of remedial measures. 	<ol style="list-style-type: none"> 1. Confirm receipt of notification of failure in writing; 2. Notify Contractor; 3. Require Contractor to propose remedial measures for the analysed noise problem; 4. Ensure remedial measures are properly implemented. 	<ol style="list-style-type: none"> 1. Submit noise mitigation proposals to IEC; 2. Implement noise mitigation proposals.
Limit Level	<ol style="list-style-type: none"> 1. Identify source; 2. Inform IEC, ER, EPD and Contractor; 3. Repeat measurements to confirm findings; 4. Increase monitoring frequency; 5. Carry out analysis of Contractor's working procedures to determine possible mitigation to be implemented; 6. Inform IEC, ER and EPD the causes and actions taken for the exceedances; 7. Assess effectiveness of Contractor's remedial actions and keep IEC, EPD and ER informed of the results; 8. If exceedance stops, cease additional monitoring. 	<ol style="list-style-type: none"> 1. Discuss amongst ER, ET, and Contractor on the potential remedial actions; 2. Review Contractors remedial actions whenever necessary to assure their effectiveness and advise the ER accordingly; 3. Supervise the implementation of remedial measures. 	<ol style="list-style-type: none"> 1. Confirm receipt of notification of failure in writing; 2. Notify Contractor; 3. Require Contractor to propose remedial measures for the analysed noise problem; 4. Ensure remedial measures properly implemented; 5. If exceedance continues, consider what portion of the work is responsible and instruct the Contractor to stop that portion of work until the exceedance is abated. 	<ol style="list-style-type: none"> 1. Take immediate action to avoid further exceedance; 2. Submit proposals for remedial actions to IEC within 3 working days of notification; 3. Implement the agreed proposals; 4. Resubmit proposals if problem still not under control; 5. Stop the relevant portion of works as determined by the ER until the exceedance is abated.

Appendix G

VALID CALIBRATION CERTIFICATES

TSP SAMPLER CALIBRATION CALCULATION SPREADSHEET

Location : RE's Site Office	Date of Calibration: 2-Jul-18
Location ID : AM2a	Next Calibration Date: 2-Sep-18
	Technician: Fai So

CONDITIONS

Sea Level Pressure (hPa)	1003.4	Corrected Pressure (mm Hg)	752.55
Temperature (°C)	29.5	Temperature (K)	303

CALIBRATION ORIFICE

Make-> TISCH	Qstd Slope ->
Model-> 5025A	2.02017
Serial # -> 1612	Qstd Intercept ->
	-0.03691

CALIBRATION

Plate No.	H2O (L) (in)	H2O (R) (in)	H2O (in)	Qstd (m3/min)	I (chart)	IC corrected	LINEAR REGRESSION
18	6.10	6.10	12.2	1.726	53	51.96	Slope = 26.9287 Intercept = 4.7187 Corr. coeff. = 0.9973
13	5.30	5.30	10.6	1.610	49	48.03	
10	4.10	4.10	8.2	1.418	43	42.15	
7	2.10	2.10	4.2	1.020	32	31.37	
5	1.20	1.20	2.4	0.776	27	26.47	

Calculations :

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

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

Qstd = standard flow rate

IC = corrected chart responses

I = actual chart response

m = calibrator Qstd slope

b = calibrator Qstd intercept

Ta = actual temperature during calibration (deg K)

Pstd = actual pressure during calibration (mm Hg)

For subsequent calculation of sampler flow:

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

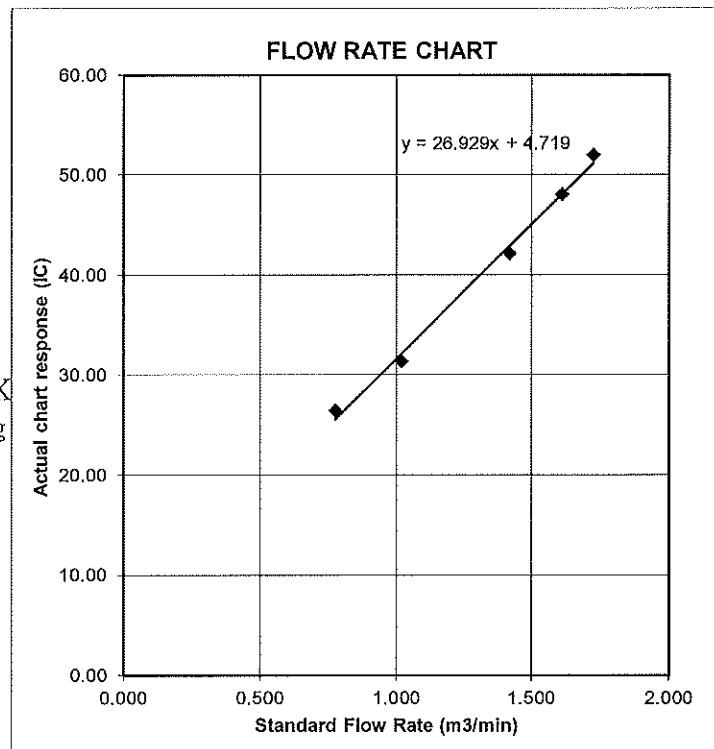
m = sampler slope

b = sampler intercept

I = chart response

Tav = daily average temperature

Pav = daily average pressure



TSP SAMPLER CALIBRATION CALCULATION SPREADSHEET

Location : No. 31 Wai Loi Tsuen	Date of Calibration: 2-Jul-18
Location ID : AM1	Next Calibration Date: 2-Sep-18
	Technician: Fai So

CONDITIONS

Sea Level Pressure (hPa)	1003.4	Corrected Pressure (mm Hg)	752.55
Temperature (°C)	29.5	Temperature (K)	303

CALIBRATION ORIFICE

Make-> TISCH	Qstd Slope -> 2.02017
Model-> 5025A	Qstd Intercept -> -0.03691
Serial # -> 1612	

CALIBRATION

Plate No.	H2O (L) (in)	H2O (R) (in)	H2O (in)	Qstd (m3/min)	I (chart)	IC corrected	LINEAR REGRESSION
18	6.00	6.00	12.0	1.712	51	49.99	Slope = 24.5915 Intercept = 7.3462 Corr. coeff. = 0.9990
13	5.20	5.20	10.4	1.595	47	46.07	
10	4.10	4.10	8.2	1.418	43	42.15	
7	2.30	2.30	4.6	1.067	34	33.33	
5	1.30	1.30	2.6	0.807	28	27.45	

Calculations :

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

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

Qstd = standard flow rate

IC = corrected chart responses

I = actual chart response

m = calibrator Qstd slope

b = calibrator Qstd intercept

Ta = actual temperature during calibration (deg K)

Pstd = actual pressure during calibration (mm Hg)

For subsequent calculation of sampler flow:

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

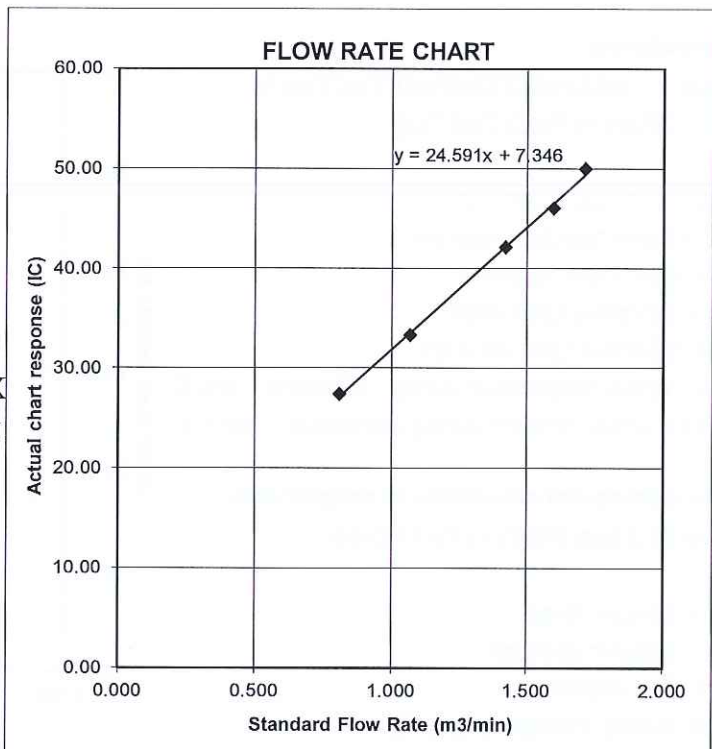
m = sampler slope

b = sampler intercept

I = chart response

Tav = daily average temperature

Pav = daily average pressure





RECALIBRATION
DUE DATE:
February 13, 2019

Certificate of Calibration

Calibration Certification Information			
Cal. Date: February 13, 2018	Rootsometer S/N: 438320	Ta: 293 °K	
Operator: Jim Tisch		Pa: 763.3 mm Hg	
Calibration Model #: TE-5025A	Calibrator S/N: 1612		

Run	Vol. Init (m3)	Vol. Final (m3)	ΔVol. (m3)	ΔTime (min)	ΔP (mm Hg)	ΔH (in H2O)
1	1	2	1	1.3970	3.2	2.00
2	3	4	1	1.0000	6.3	4.00
3	5	6	1	0.8900	7.9	5.00
4	7	8	1	0.8440	8.7	5.50
5	9	10	1	0.7010	12.6	8.00

Data Tabulation					
Vstd (m3)	Qstd (x-axis)	$\sqrt{\Delta H \left(\frac{Pa}{Pstd} \right) \left(\frac{Tstd}{Ta} \right)}$ (y-axis)	Va	Qa (x-axis)	$\sqrt{\Delta H \left(\frac{Ta}{Pa} \right)}$ (y-axis)
1.0172	0.7281	1.4293	0.9958	0.7128	0.8762
1.0130	1.0130	2.0213	0.9917	0.9917	1.2392
1.0109	1.1358	2.2599	0.9896	1.1120	1.3854
1.0098	1.1964	2.3702	0.9886	1.1713	1.4530
1.0046	1.4331	2.8586	0.9835	1.4030	1.7524
QSTD	m=	2.02017	QA	m=	1.26500
	b=	-0.03691		b=	-0.02263
	r=	0.99988		r=	0.99988

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

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

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

ALS Technichem (HK) Pty Ltd

ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES



SUB-CONTRACTING REPORT

CONTACT	: MR BEN TAM	WORK ORDER	: HK1825886
CLIENT	: ACTION UNITED ENVIRONMENT SERVICES AND CONSULTING		
ADDRESS	: RM A 20/F., GOLD KING IND BLDG, NO. 35-41 TAI LIN PAI ROAD, KWAI CHUNG, N.T. HONG KONG	SUB-BATCH	: 1
		DATE RECEIVED	: 12-APR-2018
		DATE OF ISSUE	: 19-APR-2018
PROJECT	: ITEM B5 (CALIBRATION SERVICE) OF WATER ANALYSIS IN YEAR NO. OF SAMPLES 2018		: 1
		CLIENT ORDER	:

General Comments

- Sample(s) were received in ambient condition.
- Sample(s) analysed and reported on an as received basis.
- Calibration was subcontracted to and analysed by Action United Enviro Services.

Signatories

This document has been signed by those names that appear on this report and are the authorised signatories

Signatories

Position

R.P

Richard Fung  General Manager

This is the Final Report and supersedes any preliminary report with this batch number.

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

ALS Technichem (HK) Pty Ltd
Part of the **ALS Laboratory Group**
11/F, Chung Shun Knitting Centre, 1 - 3 Wing Yip Street, Kwai Chung, N.T., Hong Kong
Tel. +852 2610 1044 Fax. +852 2610 2021 www.alsglobal.com

WORK ORDER : HK1825886
SUB-BATCH : 1
CLIENT : ACTION UNITED ENVIRONMENT SERVICES AND CONSULTING
PROJECT : ITEM B5 (CALIBRATION SERVICE) OF WATER ANALYSIS IN YEAR 2018



ALS Lab ID	Client's Sample ID	Sample Type	Sample Date	External Lab Report No.
HK1825886-001	S/N. 366407	Equipments	17-Apr-2018	S/N. 366407

Equipment Verification Report (TSP)

Equipment Calibrated:

Type: Laser Dust monitor
 Manufacturer: Sibata LD-3B
 Serial No. 366407
 Equipment Ref: EQ107
 Job Order HK1825886

Standard Equipment:

Standard Equipment: Higher Volume Sampler
 Location & Location ID: AUES office (calibration room)
 Equipment Ref: HVS 018
 Last Calibration Date: 27 February 2018

Equipment Verification Results:

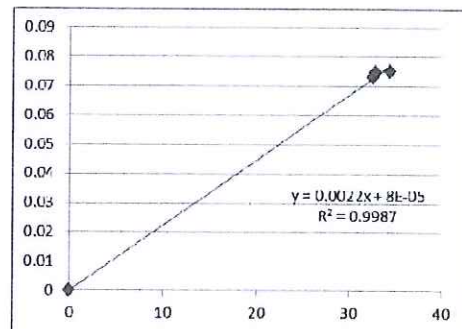
Testing Date: 12 & 13 March 2018

Hour	Time	Mean Temp °C	Mean Pressure (hPa)	Concentration in mg/m ³ (Standard Equipment)	Total Count (Calibrated Equipment)	Count/Minute (Total Count/60min)
2hr07min	9:50 ~ 11:57	19.6	1019.0	0.073	4126	32.6
2hr14min	12:05 ~ 14:19	19.6	1019.0	0.075	4414	32.8
2hr17min	9:50 ~ 12:07	20.9	1016.7	0.075	4723	34.4

Sensitivity Adjustment Scale Setting (Before Calibration) 565 (CPM)
 Sensitivity Adjustment Scale Setting (After Calibration) 566 (CPM)

Linear Regression of Y or X

Slope (K-factor): 0.0022
 Correlation Coefficient (R): 0.9993
 Date of Issue 15 March 2018



Remarks:

1. **Strong** Correlation ($R > 0.8$)
 2. Factor 0.0022 should be apply for TSP monitoring
- *If $R < 0.5$, repair or re-verification is required for the equipment

Operator : Martin Li Signature : [Signature] Date : 15 March 2018

QC Reviewer : Ben Tam Signature : [Signature] Date : 15 March 2018

TSP SAMPLER CALIBRATION CALCULATION SPREADSHEET

Location : Gold King Industrial Building, Kwai Chung Date of Calibration: 27-Feb-18
 Location ID : Calibration Room Next Calibration Date: 27-May-18

CONDITIONS

Sea Level Pressure (hPa)	1017.3	Corrected Pressure (mm Hg)	762.975
Temperature (°C)	19.1	Temperature (K)	292

CALIBRATION ORIFICE

Make->	TISCH	Qstd Slope ->	2.11965
Model->	5025A	Qstd Intercept ->	-0.02696
Calibration Date->	28-Feb-17	Expiry Date->	28-Feb-18

CALIBRATION

Plate No.	H2O (L) (in)	H2O (R) (in)	H2O (in)	Qstd (m3/min)	I (chart)	IC corrected	LINEAR REGRESSION		
							Slope =	Intercept =	Corr. coeff. =
18	6.2	6.2	12.4	1.694	52	52.63	Slope =	39.8525	
13	5.1	5.1	10.2	1.538	46	46.55	Intercept =	-14.3322	
10	3.9	3.9	7.8	1.346	40	40.48	Corr. coeff. =	0.9974	
8	2.6	2.6	5.2	1.101	30	30.36			
5	1.7	1.7	3.4	0.893	20	20.24			

Calculations :

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

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

Qstd = standard flow rate

IC = corrected chart responses

I = actual chart response

m = calibrator Qstd slope

b = calibrator Qstd intercept

Ta = actual temperature during calibration (deg K)

Pstd = actual pressure during calibration (mm Hg)

For subsequent calculation of sampler flow:

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

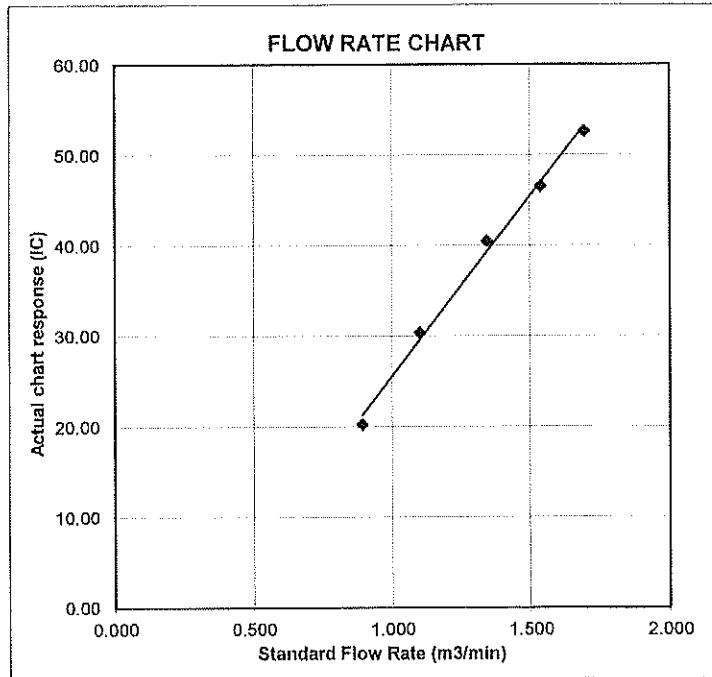
m = sampler slope

b = sampler intercept

I = chart response

Tav = daily average temperature

Pav = daily average pressure



ALS Technichem (HK) Pty Ltd

ALS Laboratory Group

ANALYTICAL CHEMISTRY & TESTING SERVICES



SUB-CONTRACTING REPORT

CONTACT	: MR BEN TAM	WORK ORDER	: HK1815073
CLIENT	: ACTION UNITED ENVIRONMENT SERVICES AND CONSULTING		
ADDRESS	: RM A 20/F., GOLD KING IND BLDG, NO. 35-41 TAI LIN PAI ROAD, KWAI CHUNG, N.T. HONG KONG	SUB-BATCH	: 1
		DATE RECEIVED	: 5-JAN-2018
		DATE OF ISSUE	: 5-FEB-2018
PROJECT	: ---	NO. OF SAMPLES	: 1
		CLIENT ORDER	: ---

General Comments

- Sample(s) were received in ambient condition.
- Sample(s) analysed and reported on an as received basis.

Signatories

This document has been signed by those names that appear on this report and are the authorised signatories

Signatories

Position

Richard Fung  General Manager

This is the Final Report and supersedes any preliminary report with this batch number.

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

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Part of the ALS Laboratory Group

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Tel. +852 2610 1044 Fax +852 2610 2021 www.alsglobal.com

WORK ORDER : HK1815073
SUB-BATCH : 1
CLIENT : ACTION UNITED ENVIRONMENT SERVICES AND CONSULTING
PROJECT : ----



ALS Lab ID	Client's Sample ID	Sample Type	Sample Date	External Lab Report No.
HK1815073-001	S/N. 2X6145	AIR	05-Jan-2018	S/N 2X6145

Equipment Verification Report (TSP)

Equipment Calibrated:

Type: Laser Dust monitor
 Manufacturer: Sibata LD-3B
 Serial No. 2X6145
 Equipment Ref: EQ105
 Job Order HK1815073

Standard Equipment:

Standard Equipment: Higher Volume Sampler
 Location & Location ID: AUES office (calibration room)
 Equipment Ref: HVS 018
 Last Calibration Date: 1 December 2017

Equipment Verification Results:

Testing Date: 5 January 2018

Hour	Time	Mean Temp °C	Mean Pressure (hPa)	Concentration in mg/m ³ (Standard Equipment)	Total Count (Calibrated Equipment)	Count/Minute (Total Count/60min)
2hr07min	10:27 ~ 12:34	19.3	1015.3	0.011	511	4.0
2hr01min	12:38 ~ 14:39	19.3	1015.3	0.012	598	4.9
2hr08min	14:42 ~ 16:50	19.3	1015.3	0.036	2111	16.5

Sensitivity Adjustment Scale Setting (Before Calibration) 583 (CPM)

Sensitivity Adjustment Scale Setting (After Calibration) 583 (CPM)

Linear Regression of Y or X

Slope (K-factor): 0.0022

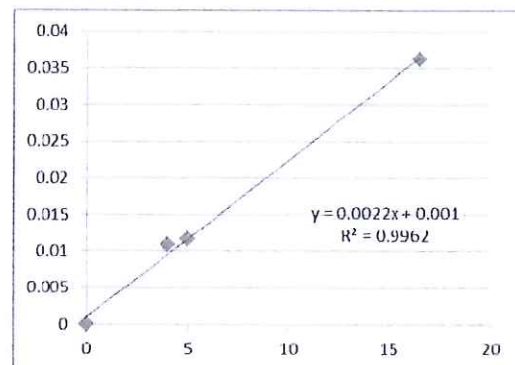
Correlation Coefficient 0.9981

Date of Issue 9 January 2018

Remarks:

- Strong** Correlation ($R > 0.8$)
- Factor 0.0022 should be apply for TSP monitoring

*If $R < 0.5$, repair or re-verification is required for the equipment



Operator : Martin Li Signature : [Signature] Date : 9 January 2018

QC Reviewer : Ben Tam Signature : [Signature] Date : 9 January 2018

TSP SAMPLER CALIBRATION CALCULATION SPREADSHEET

Location : Gold King Industrial Building, Kwai Chung	Date of Calibration: 1-Dec-17
Location ID : Calibration Room	Next Calibration Date: 1-Mar-18

CONDITIONS

Sea Level Pressure (hPa)	1018.8	Corrected Pressure (mm Hg)	764.1
Temperature (°C)	21.2	Temperature (K)	294

CALIBRATION ORIFICE

Make->	TISCH	Qstd Slope ->	2.11965
Model->	5025A	Qstd Intercept ->	-0.02696
Calibration Date->	28-Feb-17	Expiry Date->	28-Feb-18

CALIBRATION

Plate No.	H2O (L) (in)	H2O (R) (in)	H2O (in)	Qstd (m3/min)	I (chart)	IC corrected	LINEAR REGRESSION		
							Slope =	Intercept =	Corr. coeff. =
18	6.3	6.3	12.6	1.703	54	54.49	Slope = 31.2239 Intercept = 0.7901 Corr. coeff. = 0.9971		
13	5	5	10.0	1.518	48	48.44			
10	3.9	3.9	7.8	1.342	42	42.38			
8	2.4	2.4	4.8	1.056	32	32.29			
5	1.0	1.0	2.0	0.686	23	23.21			

Calculations :

$$Qstd = 1/m[\text{Sqrt}(H20(Pa/Pstd)(Tstd/Ta))-b]$$

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

Qstd = standard flow rate

IC = corrected chart responses

I = actual chart response

m = calibrator Qstd slope

b = calibrator Qstd intercept

Ta = actual temperature during calibration (deg K)

Pstd = actual pressure during calibration (mm Hg)

For subsequent calculation of sampler flow:

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

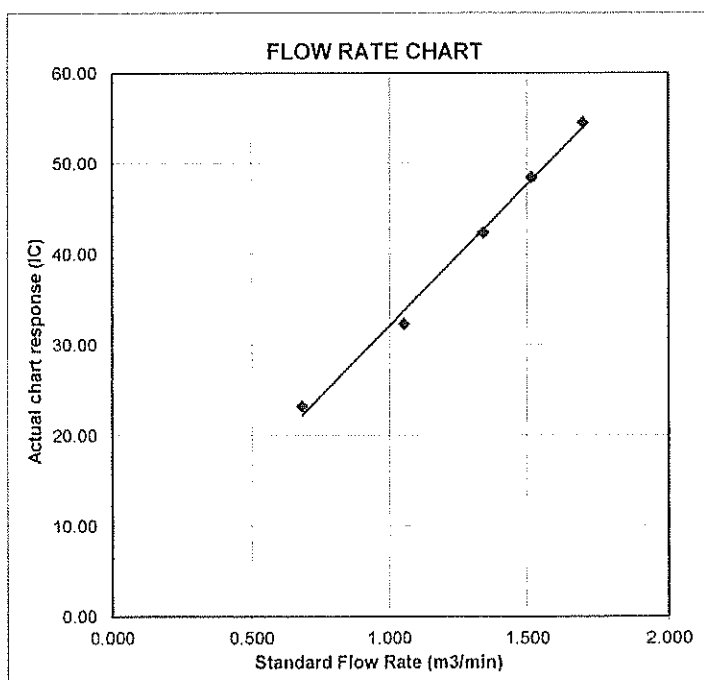
m = sampler slope

b = sampler intercept

I = chart response

Tav = daily average temperature

Pav = daily average pressure





輝創工程有限公司
Sun Creation Engineering Limited
Calibration & Testing Laboratory

Certificate of Calibration 校正證書

Certificate No. : C182473
證書編號

ITEM TESTED / 送檢項目 (Job No. / 序引編號 : IC18-0867) Date of Receipt / 收件日期 : 26 April 2018
Description / 儀器名稱 : Sound Level Meter (EQ015)
Manufacturer / 製造商 : Rion
Model No. / 型號 : NL-52
Serial No. / 編號 : 00142581
Supplied By / 委託者 : Action-United Environmental Services and Consulting
Unit A, 20/F., Gold King Industrial Building,
35-41 Tai Lin Pai Road, Kwai Chung, N.T.

TEST CONDITIONS / 測試條件

Temperature / 溫度 : $(23 \pm 2)^{\circ}\text{C}$ Relative Humidity / 相對濕度 : $(50 \pm 25)\%$
Line Voltage / 電壓 : ---

TEST SPECIFICATIONS / 測試規範

Calibration check


DATE OF TEST / 測試日期 : 12 May 2018

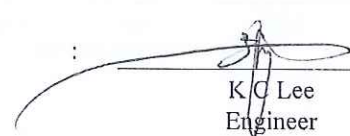
TEST RESULTS / 測試結果

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 : H T Wong
Technical Officer

Certified By : 
核證 : K C Lee
Engineer

Date of Issue : 15 May 2018
簽發日期

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 & Testing Laboratory

c/o 4/F, 1 Hing On Lane, Tuen Mun, New Territories, Hong Kong

輝創工程有限公司 - 校正及檢測實驗室

c/o 香港新界屯門興安里一號四樓

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輝創工程有限公司

Sun Creation Engineering Limited
Calibration & Testing Laboratory

Certificate of Calibration

校正證書

Certificate No. : C182473
證書編號

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 was performed before the test.
3. The results presented are the mean of 3 measurements at each calibration point.
4. Test equipment :

<u>Equipment ID</u>	<u>Description</u>	<u>Certificate No.</u>
CL280	40 MHz Arbitrary Waveform Generator	C180024
CL281	Multifunction Acoustic Calibrator	PA160023

5. Test procedure : MA101N.

6. Results :

- 6.1 Sound Pressure Level

- 6.1.1 Reference Sound Pressure Level

UUT Setting				Applied Value		UUT Reading	IEC 61672 Class 1 Spec.
Range (dB)	Function	Frequency Weighting	Time Weighting	Level (dB)	Freq. (kHz)	(dB)	(dB)
30 - 130	L _A	A	Fast	94.00	1	94.3	± 1.1

- 6.1.2 Linearity

UUT Setting				Applied Value		UUT Reading
Range (dB)	Function	Frequency Weighting	Time Weighting	Level (dB)	Freq. (kHz)	(dB)
30 - 130	L _A	A	Fast	94.00	1	94.3 (Ref.)
				104.00		104.3
				114.00		114.3

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

- 6.2 Time Weighting

UUT Setting				Applied Value		UUT Reading	IEC 61672 Class 1 Spec.
Range (dB)	Function	Frequency Weighting	Time Weighting	Level (dB)	Freq. (kHz)	(dB)	(dB)
30 - 130	L _A	A	Fast	94.00	1	94.3	Ref.
			Slow			94.3	± 0.3

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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Tel/電話: (852) 2927 2606 Fax/傳真: (852) 2744 8986

E-mail/電郵: callab@suncreation.com

Website/網址: www.suncreation.com



Certificate of Calibration

校正證書

Certificate No. : C182473
證書編號

6.3 Frequency Weighting

6.3.1 A-Weighting

Range (dB)	UUT Setting			Applied Value		UUT Reading (dB)	IEC 61672 Class 1 Spec. (dB)
	Function	Frequency Weighting	Time Weighting	Level (dB)	Freq.		
30 - 130	L _A	A	Fast	94.00	63 Hz	68.0	-26.2 ± 1.5
					125 Hz	78.1	-16.1 ± 1.5
					250 Hz	85.6	-8.6 ± 1.4
					500 Hz	91.0	-3.2 ± 1.4
					1 kHz	94.3	Ref.
					2 kHz	95.5	+1.2 ± 1.6
					4 kHz	95.3	+1.0 ± 1.6
					8 kHz	93.3	-1.1 (+2.1 ; -3.1)
					12.5 kHz	89.9	-4.3 (+3.0 ; -6.0)

6.3.2 C-Weighting

Range (dB)	UUT Setting			Applied Value		UUT Reading (dB)	IEC 61672 Class 1 Spec. (dB)
	Function	Frequency Weighting	Time Weighting	Level (dB)	Freq.		
30 - 130	L _C	C	Fast	94.00	63 Hz	93.5	-0.8 ± 1.5
					125 Hz	94.1	-0.2 ± 1.5
					250 Hz	94.3	0.0 ± 1.4
					500 Hz	94.3	0.0 ± 1.4
					1 kHz	94.3	Ref.
					2 kHz	94.1	-0.2 ± 1.6
					4 kHz	93.5	-0.8 ± 1.6
					8 kHz	91.4	-3.0 (+2.1 ; -3.1)
					12.5 kHz	87.9	-6.2 (+3.0 ; -6.0)

Remarks : - UUT Microphone Model No. : UC-59 & S/N : 06015

- Mfr's Spec. : IEC 61672 Class 1

- Uncertainties of Applied Value :

94 dB :	63 Hz - 125 Hz	: ± 0.35 dB
	250 Hz - 500 Hz	: ± 0.30 dB
	1 kHz	: ± 0.20 dB
	2 kHz - 4 kHz	: ± 0.35 dB
	8 kHz	: ± 0.45 dB
	12.5 kHz	: ± 0.70 dB
104 dB :	1 kHz	: ± 0.10 dB (Ref. 94 dB)
114 dB :	1 kHz	: ± 0.10 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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Certificate of Calibration

校正證書

Certificate No. : C182470
證書編號

ITEM TESTED / 送檢項目 (Job No. / 序引編號 : IC18-0867) Date of Receipt / 收件日期 : 26 April 2018
Description / 儀器名稱 : Acoustical Calibrator (EQ082)
Manufacturer / 製造商 : Brüel & Kjær
Model No. / 型號 : 4231
Serial No. / 編號 : 2713428
Supplied By / 委託者 : Action-United Environmental Services and Consulting
Unit A, 20/F., Gold King Industrial Building,
35-41 Tai Lin Pai Road, Kwai Chung, N.T.

TEST CONDITIONS / 測試條件

Temperature / 溫度 : $(23 \pm 2)^{\circ}\text{C}$ Relative Humidity / 相對濕度 : $(50 \pm 25)\%$
Line Voltage / 電壓 : ---

TEST SPECIFICATIONS / 測試規範

Calibration check

DATE OF TEST / 測試日期 : 12 May 2018

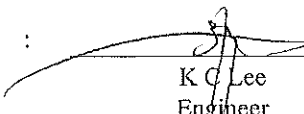
TEST RESULTS / 測試結果

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 : _____
H T Wong
Technical Officer

Certified By : 
核證 : _____
K C Lee
Engineer

Date of Issue : 15 May 2018
簽發日期

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Certificate of Calibration

校正證書

Certificate No. : C182470
證書編號

- The unit-under-test (UUT) was allowed to stabilize in the laboratory for over 12 hours before the commencement of the test.
- The results presented are the mean of 3 measurements at each calibration point.
- Test equipment :

<u>Equipment ID</u>	<u>Description</u>	<u>Certificate No.</u>
CL130	Universal Counter	C173864
CL281	Multifunction Acoustic Calibrator	PA160023
TST150A	Measuring Amplifier	C181288

4. Test procedure : MA100N.

5. Results :

5.1 Sound Level Accuracy

UUT Nominal Value	Measured Value (dB)	Mfr's Spec. (dB)	Uncertainty of Measured Value (dB)
94 dB, 1 kHz	94.0	± 0.2	± 0.2
114 dB, 1 kHz	114.1		

5.2 Frequency Accuracy

UUT Nominal Value (kHz)	Measured Value (kHz)	Mfr's Spec.	Uncertainty of Measured Value (Hz)
1	1.000 0	1 kHz ± 0.1 %	± 0.1

Remark : 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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Sun Creation Engineering Limited – Calibration & Testing Laboratory

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輝創工程有限公司 – 校正及檢測實驗室

c/o 香港新界屯門興安里一號四樓

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E-mail/電郵: callab@suncreation.com

Website/網址: www.suncreation.com

Appendix H

IMPACT MONITORING SCHEDULE

Impact Monitoring Schedule for Reporting Month – July 2018

Date		Dust Monitoring		Noise Monitoring
		1-hour TSP	24-hour TSP	
Sun	1-Jul-18			
Mon	2-Jul-18			
Tue	3-Jul-18			
Wed	4-Jul-18			
Thu	5-Jul-18	✓		✓
Fri	6-Jul-18		✓	
Sat	7-Jul-18			
Sun	8-Jul-18			
Mon	9-Jul-18			
Tue	10-Jul-18			
Wed	11-Jul-18	✓		✓
Thu	12-Jul-18		✓	
Fri	13-Jul-18			
Sat	14-Jul-18			
Sun	15-Jul-18			
Mon	16-Jul-18			
Tue	17-Jul-18	✓		✓
Wed	18-Jul-18		✓	
Thu	19-Jul-18			
Fri	20-Jul-18			
Sat	21-Jul-18			
Sun	22-Jul-18			
Mon	23-Jul-18	✓		✓
Tue	24-Jul-18		✓	
Wed	25-Jul-18			
Thu	26-Jul-18			
Fri	27-Jul-18			
Sat	28-Jul-18	✓		
Sun	29-Jul-18			
Mon	30-Jul-18		✓	
Tue	31-Jul-18			

✓	Monitoring Day
	Sunday or Public Holiday

Monitoring Location

Air Quality	1-hour TSP	AM1 and AM2
	24-hour TSP	AM1 and AM2a
Construction Noise		NM1 and NM2

Appendix I

24-HOUR TSP AND CONSTRUCTION NOISE MONITORING DATA

24-Hr TSP Monitoring Data for AM1

DATE	SAMPLE NUMBER	ELAPSED TIME		CHART READING		AVG TEMP (°C)	AVG AIR PRESS (hPa)	STANDARD FLOW RATE (m ³ /min)	AIR VOLUME (std m ³)	FILTER WEIGHT (g)		DUST WEIGHT COLLECTED (g)	24-Hr TSP (µg/m ³)
		INITIAL	FINAL	MIN	MAX					INITIAL	FINAL		
6-Jul-18	22924	17428.55	17452.55	1440.00	20	20.0	1002.6	0.50	725	2.6799	2.6971	0.0172	24
12-Jul-18	22953	17452.55	17476.54	1439.40	20	20.0	1003.3	0.50	725	2.6728	2.6805	0.0077	11
18-Jul-18	22999	17476.54	17500.54	1440.00	20	20.0	1003.9	0.51	730	2.6800	2.6946	0.0146	20
24-Jul-18	23010	17500.54	17524.55	1440.60	19	19.0	1005.7	0.47	671	2.6583	2.6823	0.0240	36
30-Jul-18	22735	17524.55	17548.55	1440.00	20	20.0	1004.7	0.51	729	2.6787	2.6947	0.0160	22

24-Hr TSP Monitoring Data for AM2a

DATE	SAMPLE NUMBER	ELAPSED TIME		CHART READING		AVG TEMP (°C)	AVG AIR PRESS (hPa)	STANDARD FLOW RATE (m ³ /min)	AIR VOLUME (std m ³)	FILTER WEIGHT (g)		DUST WEIGHT COLLECTED (g)	24-Hr TSP (µg/m ³)
		INITIAL	FINAL	MIN	MAX					INITIAL	FINAL		
6-Jul-18	22954	14078.88	14102.88	1440.00	53	53.0	1002.6	1.77	2543	2.6754	2.7558	0.0804	32
12-Jul-18	22955	14102.88	14126.89	1440.60	30	30.0	1003.3	0.92	1331	2.6775	2.7113	0.0338	25
18-Jul-18	22998	14126.89	14150.89	1440.00	30	30.0	1003.9	0.93	1337	2.6771	2.7074	0.0303	23
24-Jul-18	23011	14150.89	14174.89	1440.00	30	30.0	1005.7	0.93	1336	2.6583	2.7105	0.0522	39
30-Jul-18	22755	14174.89	14198.89	1440.00	38	38.5	1004.7	1.24	1785	2.6913	2.7257	0.0344	19

Noise Measurement Results (dB) of NMI

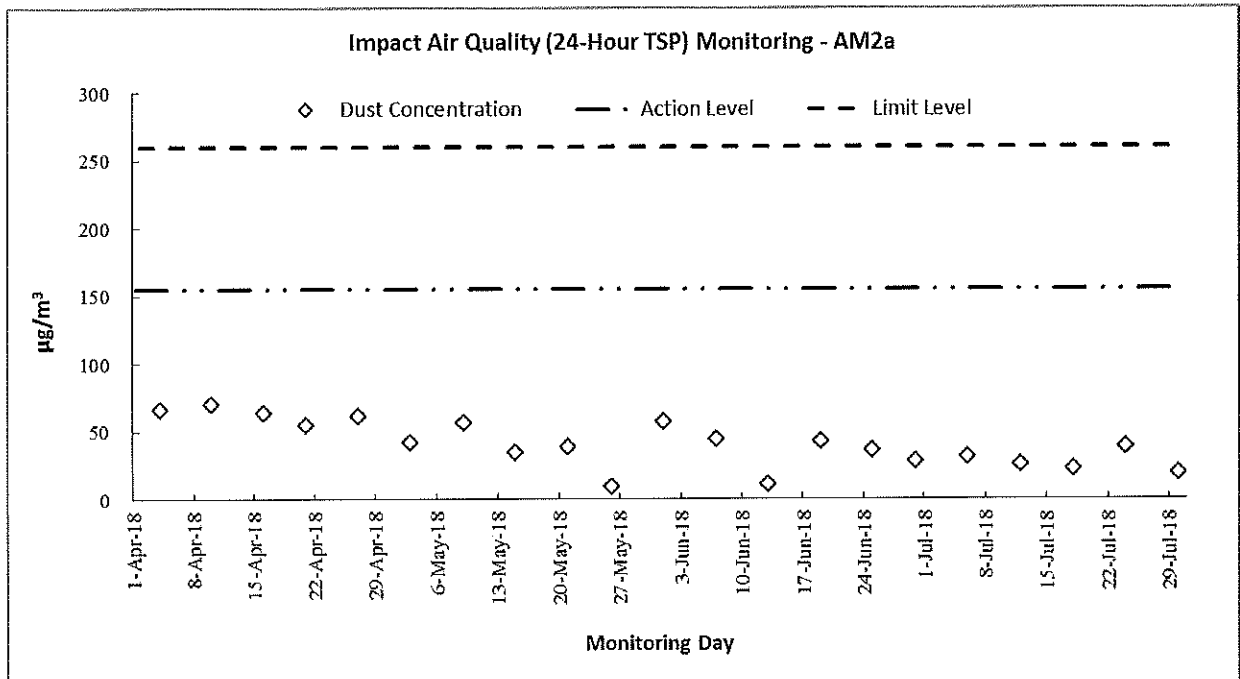
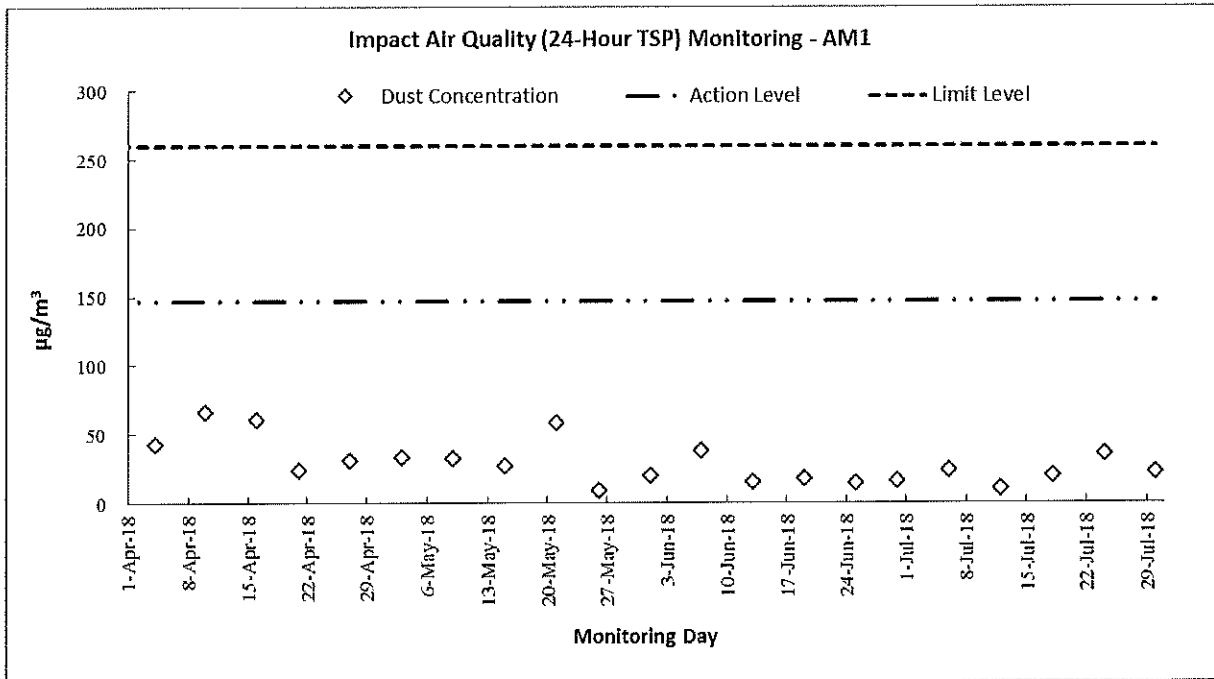
Date	Start Time	1 st Leq _{5min}		2 nd Leq _{5min}		3 rd Leq _{5min}		4 th Leq _{5min}		5 th Leq _{5min}		6 th Leq _{5min}		Leq _{30min}
		L10	L90	L10	L90	L10	L90	L10	L90	L10	L90	L10	L90	
5-Jul-18	11:21	53.9	54.1	46.1	55.2	57.7	47.3	50	51.6	46	52.8	54.8	46	53
11-Jul-18	10:00	62	65.3	52.8	62.1	65.1	55.4	61.3	64.2	53.8	62.6	65.9	53.3	62
17-Jul-18	11:12	59.1	62.2	48.9	58.5	61.3	50.9	58.4	61.7	50.4	57	60.5	47.3	58
23-Jul-18	9:38	59	61.9	49.4	60.5	63.7	51.3	60.6	63.8	51.5	61.1	64.2	52	61

Noise Measurement Results (dB) of NM2

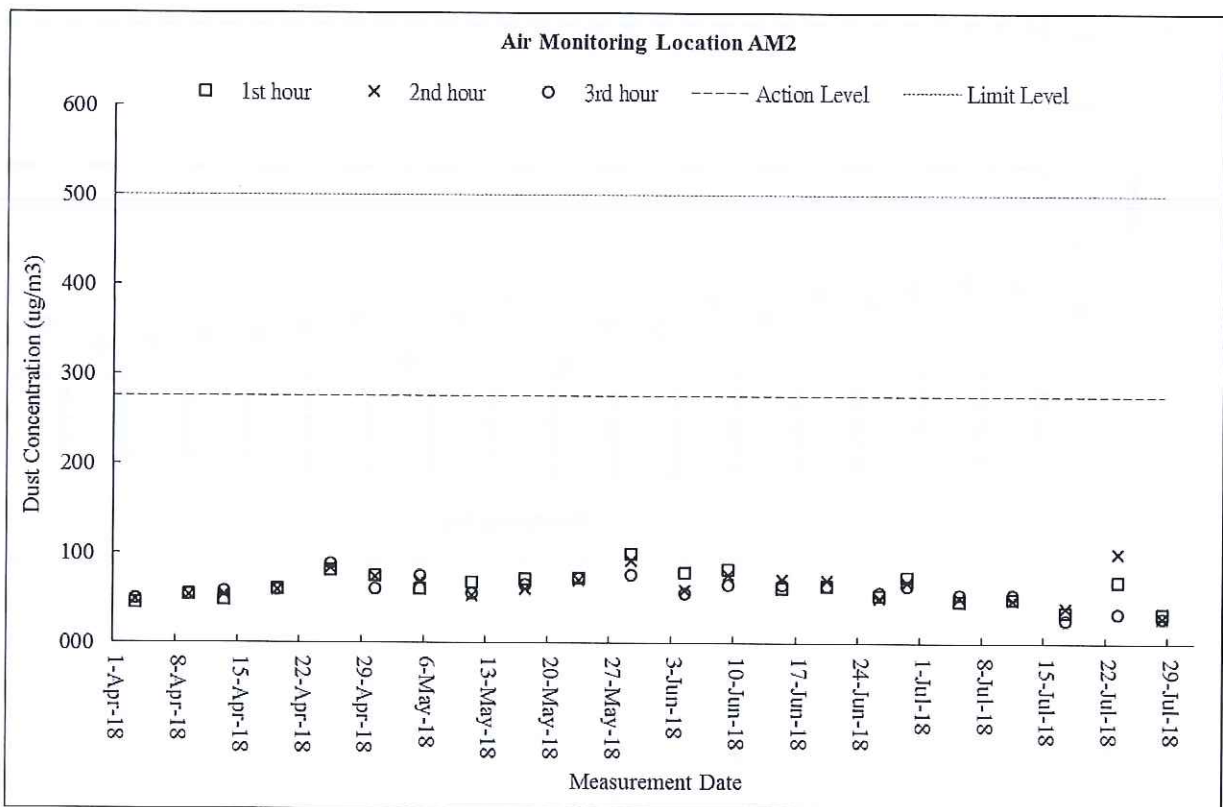
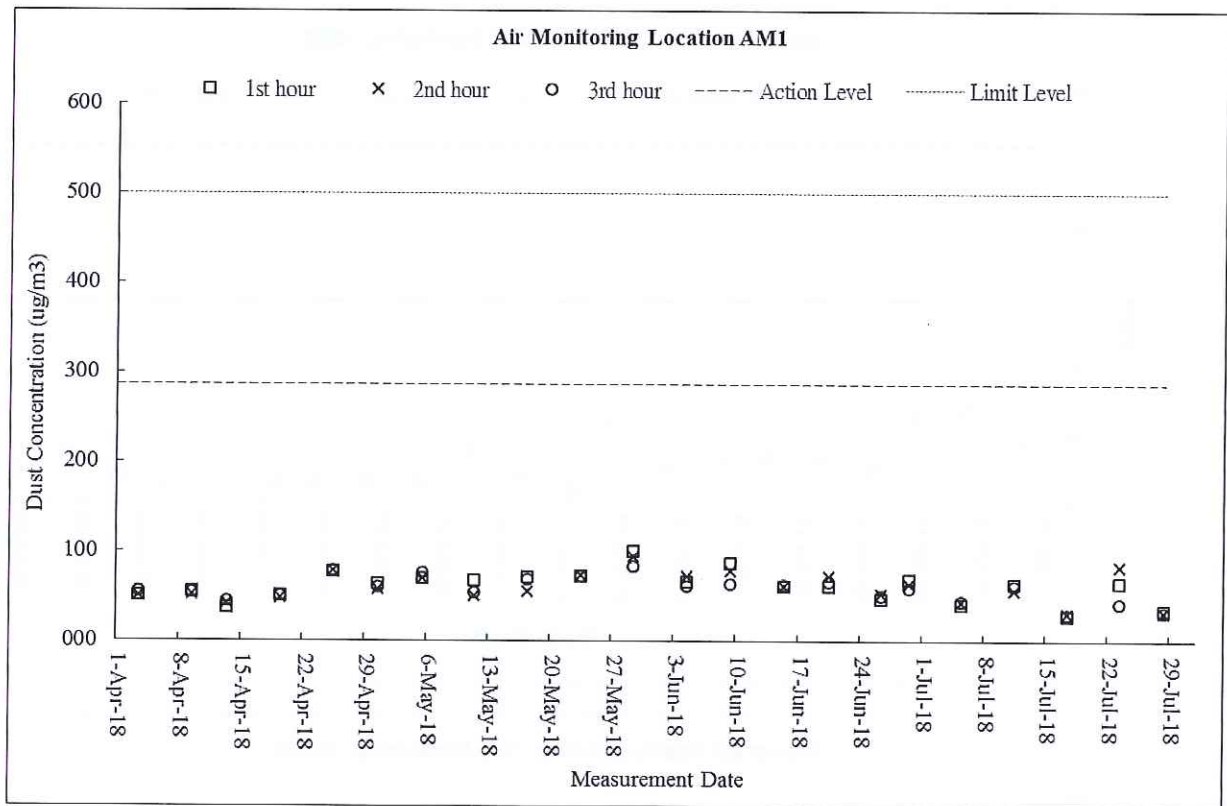
Date	Start Time	1 st Leq _{5min}		2 nd Leq _{5min}		3 rd Leq _{5min}		4 th Leq _{5min}		5 th Leq _{5min}		6 th Leq _{5min}		Leq _{30min}
		L10	L90	L10	L90	L10	L90	L10	L90	L10	L90	L10	L90	
5-Jul-18	13:26	64.6	52.3	45.4	48.3	51.3	43.8	44.5	46.4	41.8	47.0	48.9	42.9	57
11-Jul-18	10:38	54.6	57.9	46.7	56.6	59.6	48.8	58.1	60.1	48.5	61.4	63.3	52.3	59
17-Jul-18	10:36	56.4	59.4	50.6	66.4	71.0	53.6	68.4	72.5	49.0	55.2	58.5	46.9	63
23-Jul-18	10:15	58.9	62.5	47.9	61.9	65.9	47.7	60.3	64.3	49.1	57.5	61.7	46.4	60

Appendix J
GRAPHICAL PLOTS

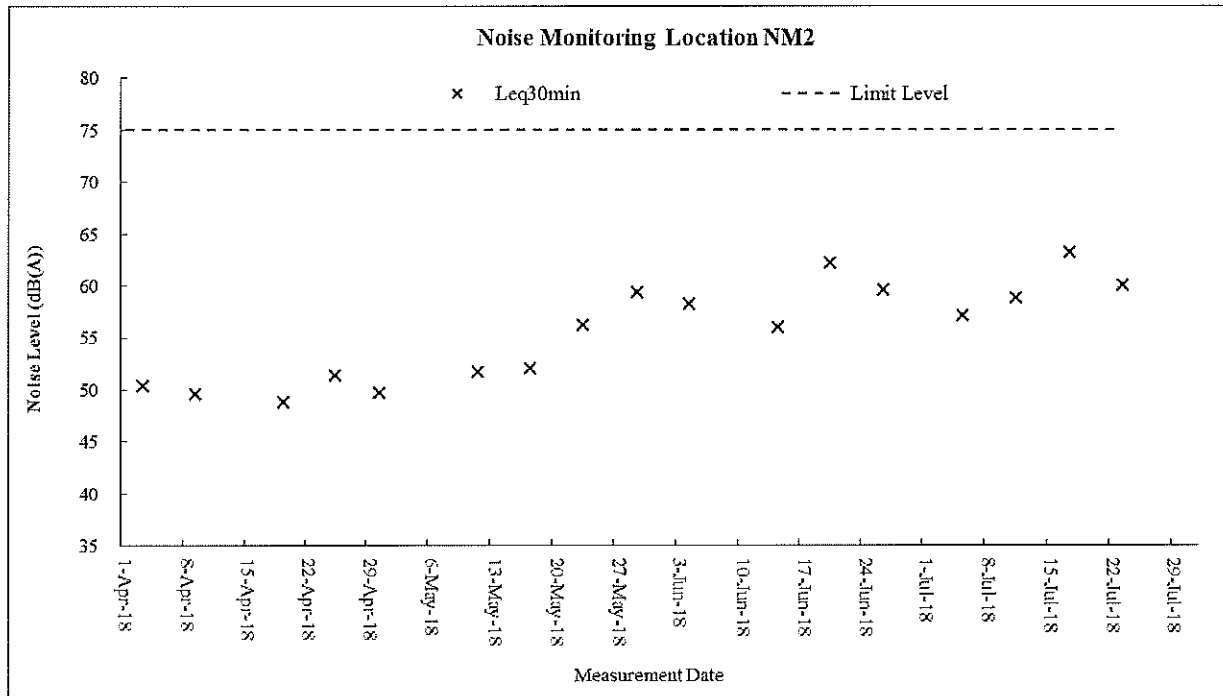
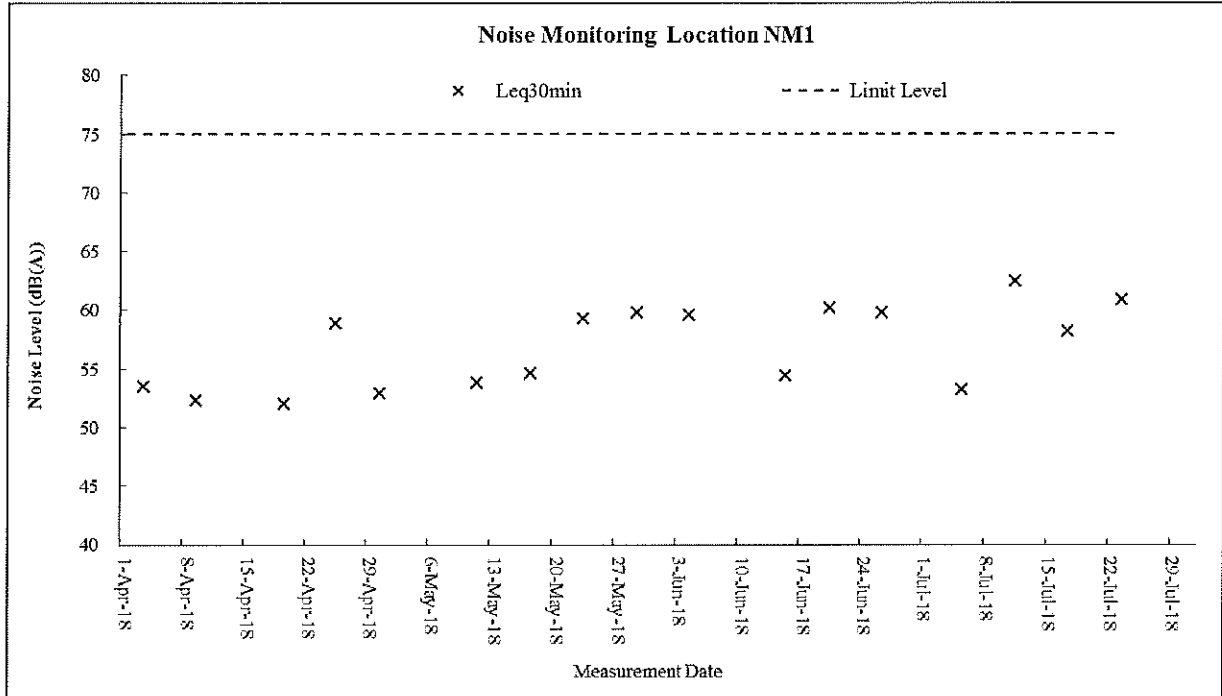
Air Quality – 24-Hour TSP



Air Quality – 1-Hour TSP



Construction Noise



Appendix K

METEOROLOGICAL DATA DURING THE REPORTING MONTH (TA KWU LING STATION)

Date		Weather	Total Rainfall (mm)	Ta Kwu Ling Station			
				Mean Air Temp. (°C)	Wind Speed (km/h)	Mean Relative Humidity (%)	Wind Direction
1-Jul-18	Sun	Sunny intervals and one or two showers.	4.2	29.7	7.9	80.1	S/SE
2-Jul-18	Mon	Sunny intervals and one or two showers.	2.1	29.4	7.8	81.2	S/SE
3-Jul-18	Tue	Sunny intervals and one or two showers.	15.4	28.6	9	85.5	S
4-Jul-18	Wed	Hot with sunny periods during the day.	3.4	29.4	9.4	81.2	S
5-Jul-18	Thu	Sunny periods and isolated showers.	1.5	28.7	6.2	86.7	E/SE
6-Jul-18	Fri	Very hot in the afternoon.	5	29.1	6.9	77.7	E/SE
7-Jul-18	Sat	Sunny periods and one or two showers.	5.2	28.7	7.8	76.3	E/NE
8-Jul-18	Sun	Hot with sunny periods during the day.	14.4	28.9	9.6	78.7	E/NE
9-Jul-18	Mon	Moderate easterly winds,	11.3	28.8	9.6	77.5	E/NE
10-Jul-18	Tue	Mainly fine and hot.	1.3	30.2	7.6	75	E/NE
11-Jul-18	Wed	Mainly fine. Very hot in the afternoon.	0	29.6	6.5	73.7	SW
12-Jul-18	Thu	Moderate to fresh east to southeasterly winds.	Trace	30.2	8.3	74.5	E/NE
13-Jul-18	Fri	Cloudy with showers and a few squally thunderstorms.	50.4	26.9	8.4	89.7	E/NE
14-Jul-18	Sat	A few showers at first. Moderate to fresh	52.7	28	8.2	87.6	E/NE
15-Jul-18	Sun	Mainly cloudy with sunny intervals.	67.4	26.6	30	88.2	E/NE
16-Jul-18	Mon	Mainly cloudy tonight. Moderate to fresh easterly winds,	5.8	28.6	11.3	78.2	E/NE
17-Jul-18	Tue	Mainly cloudy with a few showers	6.5	30	7.7	75.7	E/NE
18-Jul-18	Wed	Mainly cloudy with a few showers and isolated thunderstorms.	29.6	28	13	83.7	E/NE
19-Jul-18	Thu	Mainly cloudy with isolated showers	17.3	29.3	12	75	E/NE
20-Jul-18	Fri	Very hot with sunny periods during the day tomorrow.	7.1	28.7	7.6	83.5	E/NE
21-Jul-18	Sat	Sunny intervals and occasional showers.	0	29.5	6.8	81.3	S/SW
22-Jul-18	Sun	A few squally thunderstorms later.	Trace	29	16.5	78	S/SW
23-Jul-18	Mon	Moderate south to southeasterly winds	30.8	28.3	8.4	82.5	E/NE
24-Jul-18	Tue	Mainly cloudy with a few showers and isolated squally thunderstorms.	0.1	29.3	6.5	85	E/SE
25-Jul-18	Wed	Hot with sunny periods during the day tomorrow	2.7	29.4	8.5	84	E/NE
26-Jul-18	Thu	Mainly cloudy with one or two showers. Isolated thunderstorms at first.	3.4	29.1	9	80.2	E/NE
27-Jul-18	Fri	Mainly fine and very hot apart from isolated showers.	0.3	28.3	6	80	S/SE
28-Jul-18	Sat	Mainly fine and very hot apart from isolated showers.	0	29.3	6.3	79.2	S/SW
29-Jul-18	Sun	Mainly fine and very hot	0	29	5.4	77	S/SW
30-Jul-18	Mon	Mainly fine and very hot apart from isolated showers.	0	29.3	7.4	74.5	W/SW
31-Jul-18	Tue	Very hot with sunny periods	3.3	29.5	7.7	77.5	SW

Appendix L

MONTHLY SUMMARY WASTE FLOW TABLE

Monthly Summary Waste Flow Table

Department: Drainage Services Department Contract No.: DC/2013/09
 Contract Title: Advance Works for Shek Wu Hui Sewage Treatment Works - Further Expansion Phase 1A and Sewerage Works at Ping Che Road
 Commencement Date: 21-Jul-15 Estimated completion Date: 19-Aug-16 Estimated Contract Sum: 1.56M

Month	Actual Quantities of Inert C&D Materials Generated Monthly						Actual Quantities of C&D Wastes Generated Monthly					
	Total Quantity Generated (in '000m ³)	Hard Rock and Large Broken Concrete (in '000m ³)	Reused in the Contract (in '000m ³)	Reused in other Projects (in '000m ³)	Disposed as Public Fill (in '000m ³)	Imported Fill (in '000m ³)	Metals (in '000 kg)	Paper/ cardboard packaging (in '000kg)	Plastics (see Note 3) (in '000kg)	Chemical Waste (in '000kg)	Others, e.g. general refuse (in '000m ³)	
Jan 15	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A		
Feb 15	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A		
Mar 15	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A		
Apr 15	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A		
May 15	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A		
June 15	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A		
Sub-total	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000		
July 15	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000		
Aug 15	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000		
Sep 15	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.011		
Oct 15	0.035	0.028	0.000	0.000	0.007	0.000	43.790	0.000	0.000	0.014		
Nov 15	1.119	0.263	0.001	0.000	0.855	0.273	44.170	0.000	0.000	0.000		
Dec 15	1.300	0.744	0.001	0.000	0.555	6.123	25.550	0.000	0.000	0.026		
Total	2.454	1.035	0.002	0.000	1.417	6.396	113.510	0.000	0.000	0.051		

Notes: (1) The waste flow table should cover the whole construction period of the Contract.

(2) The original estimates of the C&D materials should be the estimates at contract commencement and should not be altered during construction.

(3) Inert C&D materials that are specified in the Contract to be imported for use at the Site shall be separately indicated.

(4) The yearly estimates of the C&D materials should be updated as appropriate taking into account the latest works programme etc.

(5) Plastics refer to plastic bottles/containers, plastic sheets/foam from packaging material.

(6) Broken concrete for recycling into aggregates.

Monthly Summary Waste Flow Table

Department: Drainage Services Department Contract No.: DC/2013/09
 Contract Title: Advance Works for Shek Wu Hui Sewage Treatment Works - Further Expansion Phase IA and Sewerage Works at Ping Che Road
 Commencement Date: 21-Jul-2015 Estimated completion Date: 19-Aug-2017 Estimated Contract Sum: 1.56M

Month	Actual Quantities of Inert C&D Materials Generated Monthly						Actual Quantities of C&D Wastes Generated Monthly				
	Total Quantity Generated (in '000m ³)	Hard Rock and Large Broken Concrete (in '000m ³)	Reused in the Contract (in '000m ³)	Reused in other Projects (in '000m ³)	Disposed as Public Fill (in '000m ³)	Imported Fill (in '000m ³)	Metals (in '000 kg)	Paper/ cardboard packaging (in '000kg)	Plastics (see Note 3) (in '000kg)	Chemical Waste (in '000kg)	Others, e.g. general refuse (in '000m ³)
Jan-16	0.335	0.111	0.060	0.000	0.164	0.000	0.000	0.000	0.000	0.000	
Feb-16	2.377	0.089	0.050	2.228	0.010	0.000	0.000	0.000	0.000	0.008	
Mar-16	0.141	0.015	0.050	0.000	0.076	0.000	0.000	0.000	0.000	0.007	
Apr-16	0.160	0.010	0.050	0.000	0.100	0.000	0.000	0.000	0.000	0.023	
May-16	0.334	0.000	0.010	0.000	0.324	0.000	0.000	0.000	0.000	0.026	
Jun-16	2.517	0.024	0.300	0.000	2.193	0.000	0.000	0.000	0.000	0.013	
Sub-total	5.863	0.249	0.520	2.228	2.866	0.000	0.000	0.000	0.000	0.076	
Jul-16	3.284	0.000	0.150	0.000	3.134	0.000	0.000	0.000	0.000	0.002	
Aug-16	0.396	0.005	0.100	0.000	0.291	0.000	4.720	0.000	0.000	0.012	
Sep-16	0.529	0.000	0.100	0.000	0.429	0.000	0.000	0.000	0.000	0.008	
Oct-16	1.151	0.000	0.300	0.000	0.851	0.000	0.000	0.000	0.000	0.013	
Nov-16	0.266	0.000	0.100	0.000	0.166	0.000	14.700	0.000	0.000	0.028	
Dec-16	0.520	0.022	0.100	0.000	0.398	0.000	0.000	0.000	0.000	0.019	
Total	12.008	0.275	1.370	2.228	8.135	0.000	19.420	0.000	0.000	0.158	

- Notes: (1) The waste flow table should cover the whole construction period of the Contract.
 (2) The original estimates of the C&D materials should be the estimates at contract commencement and should not be altered during construction.
 (3) Inert C&D materials that are specified in the Contract to be imported for use at the Site shall be separately indicated.
 (4) The yearly estimates of the C&D materials should be updated as appropriate taking into account the latest works programme etc.
 (5) Plastics refer to plastic bottles/containers, plastic sheets/foam from packaging material.

Monthly Summary Waste Flow Table

Department: Drainage Services Department Contract No.: DC/2013/09
 Contract Title: Advance Works for Shek Wu Hui Sewage Treatment Works - Further Expansion Phase 1A and Sewerage Works at Ping Che Road
 Commencement Date: 21-Jul-2015 Estimated completion Date: 19-Aug-2017 Estimated Contract Sum: 1.56M

Month	Actual Quantities of Inert C&D Materials Generated Monthly						Actual Quantities of C&D Wastes Generated Monthly					
	Total Quantity Generated (in '000m ³)	Hard Rock and Large Broken Concrete (in '000m ³)	Reused in the Contract (in '000m ³)	Reused in other Projects (in '000m ³)	Disposed as Public Fill (in '000m ³)	Imported Fill (in '000m ³)	Metals (in '000 kg)	Paper/ cardboard packaging (in '000kg)	Plastics (see Note 3) (in '000kg)	Chemical Waste (in '000kg)	Others, e.g. general refuse (in '000m ³)	
Jan-17	0.304	0.089	0.100	0.000	0.115	0.000	0.000	0.000	0.000	0.023		
Feb-17	0.660	0.000	0.400	0.000	0.260	0.000	1.830	0.000	0.000	0.051		
Mar-17	0.326	0.076	0.200	0.000	0.050	0.000	1.190	0.015	0.000	0.029		
Apr-17	1.100	0.000	0.200	0.000	0.900	0.000	0.620	0.000	0.000	0.029		
May-17	0.600	0.000	0.100	0.000	0.500	0.000	0.000	0.000	0.000	0.019		
Jun-17	0.600	0.000	0.200	0.000	0.400	0.000	0.000	0.000	0.000	0.031		
Sub-total	3.590	0.165	1.200	0.000	2.225	0.000	3.640	0.015	0.000	0.182		
Jul-17	0.344	0.000	0.100	0.000	0.244	0.000	0.000	0.000	0.000	0.041		
Aug-17	0.461	0.011	0.400	0.000	0.050	0.000	0.000	0.000	0.000	0.067		
Sep-17	0.602	0.016	0.000	0.000	0.586	0.000	0.000	0.000	0.000	0.082		
Oct-17	0.515	0.106	0.100	0.000	0.309	0.000	5.060	0.000	0.000	0.063		
Nov-17	0.331	0.062	0.000	0.000	0.268	0.000	0.000	0.000	0.000	0.126		
Dec-17	0.234	0.068	0.000	0.000	0.166	0.000	0.370	0.059	0.001	0.100		
Total	6.077	0.428	1.800	0.000	3.848	0.000	9.070	0.074	0.001	0.662		

- Notes: (1) The waste flow table should cover the whole construction period of the Contract.
 (2) The original estimates of the C&D materials should be the estimates at contract commencement and should not be altered during construction.
 (3) Inert C&D materials that are specified in the Contract to be imported for use at the Site shall be separately indicated.
 (4) The yearly estimates of the C&D materials should be updated as appropriate taking into account the latest works programme etc.
 (5) Plastics refer to plastic bottles/containers, plastic sheets/foam from packaging material.

Monthly Summary Waste Flow Table

Department: Drainage Services Department Contract No.: DC/2013/09
 Contract Title: Advance Works for Shek Wu Hui Sewage Treatment Works - Further Expansion Phase 1A and Sewerage Works at Ping Che Road
 Commencement Date: 2015/7/21 Estimated completion Date: 2018/3/9 Estimated Contract Sum: 1.56M

Month-Year	Actual Quantities of Inert C&D Materials Generated Monthly						Actual Quantities of C&D Wastes Generated Monthly					
	Total Quantity Generated (in '000m ³)	Hard Rock and Large Broken Concrete (in '000m ³)	Reused in the Contract (in '000m ³)	Reused in other Projects (in '000m ³)	Disposed as Public Fill (in '000m ³)	Imported Fill (in '000m ³)	Metals (in '000 kg)	Paper/ cardboard packaging (in '000kg)	Plastics (see Note 3) (in '000kg)	Chemical Waste (in '000kg)	Others, e.g. general refuse (in '000m ³)	
Jan-2018	0.072	0.049	0.000	0.000	0.023	0.000	0.000	0.000	0.000	0.046		
Feb-2018	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.022		
Mar-2018	0.190	0.006	0.000	0.000	0.184	0.000	0.000	0.000	0.000	0.030		
Apr-2018	0.991	0.328	0.100	0.000	0.563	0.000	0.000	0.000	0.000	0.041		
May-2018	0.293	0.116	0.000	0.000	0.177	0.000	0.000	0.000	0.000	0.024		
June-2018	0.270	0.000	0.100	0.000	0.170	0.000	0.000	0.000	0.000	0.073		
Sub-total	1.816	0.499	0.200	0.000	1.117	0.000	0.000	0.000	0.000	0.236		
July-2018	0.763	0.011	0.000	0.000	0.752	0.000	0.000	0.000	0.000	0.032		
Aug-2018												
Sep-2018												
Oct-2018												
Nov-2018												
Dec-2018												
Total	2.579	0.510	0.200	0.000	1.869	0.000	0.000	0.000	0.000	0.268		

*March 2018 data have been revised

Notes:

- (1) The waste flow table should cover the whole construction period of the Contract.
- (2) The original estimates of the C&D materials should be the estimates at contract commencement and should not be altered during construction.
- (3) Inert C&D materials that are specified in the Contract to be imported for use at the Site shall be separately indicated.
- (4) The yearly estimates of the C&D materials should be updated as appropriate taking into account the latest works programme etc.
- (5) Plastics refer to plastic bottles/containers, plastic sheets/foam from packaging material.

Appendix M

IMPLEMENTATION SCHEDULE FOR ENVIRONMENTAL MITIGATION MEASURES (ISEMM)

EM&A Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concern to Address	Who to implement the measures?	Location of the measure	When to implement the measures?	What requirements or standards for the measure to achieve
<p>Air Quality Impact S2.4.1.3</p>	<p>Dust suppression measures stipulated in the Air Pollution Control (Construction Dust) Regulation and good site practices:</p> <ul style="list-style-type: none"> • Any excavated or stockpile of dusty material should be covered entirely by impervious sheeting or sprayed with water to maintain the entire surface wet and then removed or backfilled or reinstated where practicable within 24 hours of the excavation or unloading; • Any dusty material remaining after a stockpile is removed should be wetted with water and cleared from the surface of roads; • A stockpile of dusty material should not be extended beyond the pedestrian barriers, fencing or traffic cones; • The load of dusty materials on a vehicle leaving a construction site should be covered entirely by impervious sheeting to ensure that the dusty materials do not leak from the vehicle; • Where practicable, vehicle washing facilities with high pressure water jet should be provided at every discernible or designated vehicle exit point. The area where vehicle washing takes place and the road section between the washing facilities and the exit point should be paved with concrete, bituminous materials or hardcore; • When there are open excavation and reinstatement works, hoarding of not less than 2.4m high should be provided as far as practicable along the site boundary with provision for public crossing. Good site practice shall also be adopted by the Contractor to ensure the conditions of the hoardings are properly maintained throughout the construction period. • The portion of any road leading only to construction site that is within 30m of a vehicle entrance or exit should be kept clear of dusty materials; • Surfaces where any pneumatic or power-driven drilling, cutting, polishing or other mechanical breaking operation takes place should be sprayed with water or a dust suppression chemical continuously; • Any area that involves demolition activities should be sprayed with water or a dust suppression chemical immediately prior to, during and immediately after the activities so as to maintain the entire surface wet; 	<p>To minimize the dust impact</p>	<p>Contractor</p>	<p>Work Sites</p>	<p>Construction phase of Advance Works and Main Works of Phase 1A</p>	<p>Air Pollution Control Ordinance (APCO) and Air Pollution Control (Construction Dust) Regulation</p>

EM&A Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concern to Address	Who to implement the measures?	Location of the measure	When to implement the measures?	What requirements or standards for the measure to achieve
<p>Air Quality Impact</p> <ul style="list-style-type: none"> • Where a scaffolding is erected around the perimeter of a building under construction, effective dust screens, sheeting or netting should be provided to enclose the scaffolding from the ground floor level of the building, or a canopy should be provided from the first floor level up to the highest level of the scaffolding; • Any skip hoist for material transport should be totally enclosed by impervious sheeting; • Every stock of more than 20 bags of cement or dry pulverized fuel ash (PFA) should be covered entirely by impervious sheeting or placed in an area sheltered on the top and the 3 sides; • Cement or dry PFA delivered in bulk should be stored in a closed silo fitted with an audible high level alarm which is interlocked with the material filling line and no overfilling is allowed; • Loading, unloading, transfer, handling or storage of bulk cement or dry PFA should be carried out in a totally enclosed system or facility, and any vent or exhaust should be fitted with an effective fabric filter or equivalent air pollution control system; and • Exposed earth should be properly treated by compaction, turfing, hydroseeding, vegetation planting or sealing with latex, vinyl, bitumen, shortcrete or other suitable surface stabilizer within six months after the last construction activity on the construction site or part of the construction site where the exposed earth lies. 						

EM&A Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concern to Address	Who to implement the measures?	Location of the measure	When to implement the measures?	What requirements or standards for the measure to achieve
Noise Impact						
S3.4.1.1	Use of movable barrier, enclosure, acoustic mat and quiet plant. Use of wooden frames barrier with a small-cantilevered upper portion of superficial density not less than 14kg/m ² on a skid footing with 25mm thick internal sound absorptive lining.	To minimize construction noise impact arising from the Project at the affected noise sensitive receivers (NSRs)	Contractor	Work Sites	Construction phase of Advance Works and Main Works of Phase 1A	EIAO-TM, Noise Control Ordinance (NCO)
S3.4.1.2	Good Site Practice: <ul style="list-style-type: none"> • Only well-maintained plant should be operated on-site and plant should be serviced regularly during the construction program. • Silencers or mufflers on construction equipment should be utilized and should be properly maintained during the construction program. • Mobile plant, if any, should be sited as far away from NSRs as possible. • Machines and plant (such as trucks) that may be in intermittent use should be shut down between works periods or should be throttled down to a minimum. • Plant known to emit noise strongly in one direction should, wherever possible, be orientated so that the noise is directed away from the nearby NSRs. • Material stockpiles and other structures should be effectively utilized, wherever practicable, in screening noise from on-site construction activities. 	To minimize construction noise impact arising from the Project at the affected NSRs	Contractor	Work Sites	Construction period of Advance Works and Main Works of Phase 1A	EIAO-TM, NCO

EM&A Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concern to Address	Who to implement the measures?	Location of the measure	When to implement the measures?	What requirements or standards for the measure to achieve
Ecological Impact						
S4.2.1.1	Solid dull green noise/visual barriers of at least 2m high shall be erected and maintained between active works area and all areas of ecological importance.	Minimize noise and human disturbances during construction phase.	Contractor	Work Sites	Construction phase of Advance Works and Main Works of Phase 1A	EIAO-TM
S4.2.1.2	Avoid unnecessary lighting.	Minimize mortality impacts on birds.	Design Contractor/ Plant Operator	Work Sites	Construction phase of Advance Works and Main Works of Phase 1A	EIAO-TM
S4.2.1.3	Good construction site practice to minimise dust generation should be followed on all construction sites. Measures to avoid, minimise and mitigate impacts on air quality are detailed in this schedule	Minimize dust generation from construction sites.	Contractor	Work Sites	Construction phase of Advance Works and Main Works of Phase 1A	EIAO-TM
S4.2.1.4	The following measures to avoid, minimise and mitigate impact on water quality during construction phase shall be implemented <ul style="list-style-type: none"> • Temporary sewerage and drainage to be designed and installed to collect wastewater and prevent it from entering water bodies; • Proper locations well away from nearby water bodies should be used for temporary storage of materials (i.e. equipment, filling materials, chemicals and fuel) and temporary stockpiles of construction debris and spoil, and these should be identified before commencement of works; • To prevent muddy water entering nearby water bodies, work sites close to nearby water bodies should be isolated, using such items as sandbags or silt curtains with lead edge at bottom and properly supported props. Other protective measures should also be taken to ensure that no pollution or siltation occurs to the water gathering grounds of the work sites; • Construction debris and spoil should be covered and/or properly disposed of as soon as possible to avoid these being washed into nearby water bodies; • Proper locations for discharge outlets of temporary wastewater treatment facilities well away from sensitive receivers should be identified; 	Avoid, minimise and mitigate impact on water quality	Contractor	Work Sites	Construction phase of Advance Works and Main Works of Phase 1A	EIAO-TM

EM&A Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concern to Address	Who to implement the measures?	Location of the measure	When to implement the measures?	What requirements or standards for the measure to achieve
<p>Ecological Impact</p> <ul style="list-style-type: none"> • Adequate lateral support should be erected where necessary in order to prevent soil/mud from slipping into water bodies; • Site boundaries should be clearly marked and any works beyond the boundary strictly prohibited; • Regular water monitoring and site audit should be carried out at adequate points along any watercourses where construction works are underway upstream within their catchments and also on the Ng Tung, Sheung Yue and Shek Sheung Rivers. If the monitoring and audit results show that pollution occurs, adequate measures including temporarily cessation of works should be considered; • Excavation profiles should be properly designed and executed with attention to the relevant requirements for environment, health and safety; • Where soil to be excavated is situated beneath the groundwater table, it may be necessary to lower the groundwater table by installing well points or similar means; • Stockpiling sites should be lined with impermeable sheeting and bundled. Stockpiles should be properly covered by impermeable sheeting to reduce dust emission during dry season or contaminated run-off during rainy season. Watering should be avoided on stockpiles of contaminated soil to minimize contaminated runoff and construction materials should be properly covered and located away from nearby water bodies; and • Supply of suitable clean backfill material after excavation, if required. • Vehicles containing any excavated materials should be suitably covered to limit potential dust emissions or contaminated run-off, and truck bodies and tailgates should be sealed to prevent discharge during transport or during wet season; • Speed control for the trucks carrying contaminated materials should be enforced; • Vehicle wheel washing facilities at construction sites' exit points should be established and used, where necessary; and • Other measures as detailed in this schedule. 						

EM&A Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concern to Address	Who to implement the measures?	Location of the measure	When to implement the measures?	What requirements or standards for the measure to achieve
Water Quality Impact						
S5.2.2.1	Construction Site Runoff Practices and measures provided in the Practice Note for Professional Persons on Construction Site Drainage, (PROPECC PN1/94) should be followed where applicable.	Control construction runoff	Contractors	Work Sites	Construction phase of Advance Works and Main Works of Phase 1A	EIAO-TM, WPCO, EIAO
S5.2.2.2 – S5.2.2.3	<p>Sewage from Workforce</p> <ul style="list-style-type: none"> • Portable chemical toilets and sewage holding tanks should be provided for handling the construction sewage generated by the workforce. A licensed Contractor should be employed to provide appropriate and adequate portable toilets and be responsible for appropriate disposal and maintenance. • Notices should be posted at conspicuous locations to remind the workers not to discharge any sewage or wastewater into the nearby environment during the construction phase of the Project. Regular environmental audit on construction site should be conducted in order to provide an effective control of any malpractices and achieve continual improvement of environmental performance on site. It is anticipated that sewage generation during the construction phase of the Project would not cause water quality impact after undertaking all required measures 	Handling of site sewage	Contractors	Work Sites	Construction phase of Advance Works and Main Works of Phase 1A	EIAO-TM, WPCO, EIAO

EM&A Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concern to Address	Who to implement the measures?	Location of the measure	When to implement the measures?	What requirements or standards for the measure to achieve
Waste Management						
S6.2.2.1	<p>Good Site Practices and Waste Reduction Measures:</p> <ul style="list-style-type: none"> Nomination of an approved person, such as a site manager, to be responsible for the implementation of good site practices, arrangements for collection and effective disposal to an appropriate facility, of all wastes generated at the site; Training of site personnel in site cleanliness, appropriate waste management procedures and concepts of waste reduction, reuse and recycling; Provision of sufficient waste disposal points and regular collection for disposal; Appropriate measures to minimise windblown litter and dust during transportation of waste by either covering trucks or by transporting wastes in enclosed containers; Regular cleaning and maintenance programme for drainage systems, sumps and oil interceptors; An Environmental Management Plan (EMP) should be prepared by the contractor and submitted to the Engineer for approval. 	Minimize waste generation during construction	Contractor	Work Sites	Construction phase of Advance Works and Main Works of Phase 1A	Waste Disposal Ordinance (WDO)
S6.2.3.1	<p>Waste Reduction Measures:</p> <ul style="list-style-type: none"> Segregate and store different types of waste in different containers, skip or stockpiles to enhance reuse or recycling of materials and their proper disposal; Proper storage and site practices to minimize the potential for damage and contamination of construction materials; Plan and stock construction materials carefully to minimize amount of waste generated and avoid unnecessary generation of waste; Sort out demolition debris and excavated materials from demolition works to recover reusable/recyclable portions (i.e. soil, broken concrete, metal etc.); and Provide training to workers on the importance of appropriate waste management procedures, including waste reduction, reuse and recycling. 	Reduce waste generation	Contractor	Work Sites	Prior to the commencement of construction of Advance Works and Main Works of Phase 1A	WDO
S6.2.4.1 - S6.2.4.2	<p>Storage, Collection and Transportation of Waste Should any temporary storage or stockpiling of waste is required, recommendations to minimize the impacts include:</p> <ul style="list-style-type: none"> Waste, such as soil, should be handled and stored well to ensure secure 	Minimize waste impacts arising from waste storage	Contractor	Work Sites	Construction phase of Advance Works and Main Works of Phase 1A	WDO

EM&A Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concern to Address	Who to implement the measures?	Location of the measure	When to implement the measures?	What requirements or standards for the measure to achieve
Waste Management						
	<p>containment, thus minimizing the potential of pollution;</p> <ul style="list-style-type: none"> • Stockpiling area should be provided with covers and water spraying system to prevent materials from wind-blown or being washed away; and • Different locations should be designated to stockpile each material to enhance reuse. • Remove waste in timely manner; • Employ the trucks with cover or enclosed containers for waste transportation; • Obtain relevant waste disposal permits from the appropriate authorities; and • Disposal of waste should be done at licensed waste disposal facilities. 					
S6.2.5.2	<p>C&D Materials from Site Formation</p> <ul style="list-style-type: none"> • Maintain temporary stockpiles and reuse excavated fill material for backfilling; • Carry out on-site sorting; • Make provisions in the Contract documents to allow and promote the use of recycled aggregates where appropriate; • Adopt “selective demolition” technique to demolish the existing structure and facilities with a view to recovering broken concrete effectively for recycling purpose, where possible; and • Implement a trip-ticket system for each works contract to ensure that the disposal of C&D materials are properly documented and verified. 	Minimize waste impacts from excavated and C&D materials	Contractor	Work Sites	Construction phase of Advance Works and Main Works of Phase 1A	Land (Miscellaneous Provisions) Ordinance, WDO, ETWB TCW No. 19/2005
S6.2.5.3	<p>C&D Material from Buildings Demolition and New Building Construction</p> <ul style="list-style-type: none"> • The Contractor should recycle as much as possible of the C&DM on-site. Public fill and C&DM waste should be segregated and stored in different containers or skips to enhance reuse or recycling of materials and their proper disposal. For example, concrete and masonry can be crushed and used as fill, and steel reinforcing bar can be used by scrap steel mills. Different areas of the work sites should be designated for such segregation and storage. • The use of wooden hoardings shall not be allowed. An alternative material, such as metal, aluminium or alloy etc, could be used. • Government has developed a charging policy for the disposal of waste to landfill at present. It will provide additional incentive to reduce the volume of generated waste and ensure proper segregation to allow 	Minimize waste impacts from building demolition and new building construction	Contractor	Work Sites	Construction phase of Advance Works and Main Works of Phase 1A	Land (Miscellaneous Provisions) Ordinance, WDO, ETWB TCW No. 19/2005

EM&A Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concern to Address	Who to implement the measures?	Location of the measure	When to implement the measures?	What requirements or standards for the measure to achieve
Waste Management						
	<p>reuse of the inert material on site when implemented.</p> <ul style="list-style-type: none"> In order to minimize the impacts of the demolition works, the generated wastes must be cleared as quickly as possible after demolition. Therefore, the demolition and clearance works should be undertaken simultaneously. To facilitate proper segregation of inert and non-inert C&D material arising from demolition works, selective demolition method should be adopted. 					
S6.2.5.4	<p>Chemical Waste</p> <ul style="list-style-type: none"> If chemical wastes are produced at the construction site, the Contractors should register with EPD as chemical waste producers. Chemical wastes should be stored in appropriate containers and collected by a licensed chemical waste contractor. Chemical wastes (e.g. spent lubricant oil) should be recycled at an appropriate facility as far as possible, while the chemical waste that cannot be recycled should be disposed of at either the Chemical Waste Treatment Centre, or another licensed facility, in accordance with the Waste Disposal (Chemical Waste) (General) Regulation 	Control the chemical waste and ensure proper storage, handling and disposal	Contractor	Work Sites	Construction phase of Advance Works and Main Works of Phase 1A	Waste Disposal (Chemical General) Regulation, Code of Practice on the Labeling and Storage of Chemical Waste
S6.2.5.5	<p>General Refuse</p> <ul style="list-style-type: none"> General refuse should be stored in enclosed bins separately from construction and chemical wastes. Recycling bins should also be placed to encourage recycling. Preferably enclosed and covered areas should be provided for general refuse collection and routine cleaning for these areas should also be implemented to keep areas clean. A reputable waste collector should be employed to remove general refuse on a daily basis. 	Minimize production of the general refuse and avoid odour, pest and litter impacts	Contractor	Work Sites	Construction phase of Advance Works and Main Works of Phase 1A	Waste Disposal (Chemical General) Regulation, Code of Practice on the Labeling and Storage of Chemical Waste

EM&A Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concern to Address	Who to implement the measures?	Location of the measure	When to implement the measures?	What requirements or standards for the measure to achieve
Landscape and Visual						
S7.3.1.1	<p>Good Site Practices</p> <ul style="list-style-type: none"> For areas unavoidably disturbed by the Project on a short term basis e.g. works areas, the general principle to try and restore these to their former state to suit future land use, should be adhered to. With regard to topsoil, where identified, it should be stripped, treated appropriately, and where suitable and practical stored for re-use in the construction of the soft landscape works such as roadside amenity strips, and open space sites. 	Minimize the impact to the landscape and visual	Contractor	Work Sites	Prior to construction and construction phase	
S7.3.2.1	<p>MM4 - Tree Protection & Preservation</p> <ul style="list-style-type: none"> Existing trees to be retained within the Project Site should be carefully protected during construction. In particular Old and Valuable Trees (OVTs) will be preserved according to ETWB TC (Works) No. 29/2004. Detailed Tree Protection Specification shall be provided in the Contract Specification. Under this specification, the Contractor shall be required to submit, for approval, a detailed working method statement for the protection of trees prior to undertaking any works adjacent to all retained trees, including trees in Contractor's works areas. A detailed tree survey will be carried out for the Tree Removal Application (TRA) process which will be carried out at the later detailed design stage of the Project. The detailed tree survey will propose which trees should be retained, transplanted or felled and will include details of tree protection measures for those trees to be retained. 	Protect and Preserve Trees	Designer / Contractor	Work Sites	Prior to construction and construction phase	ETWB TCW No. 10/2013, 29/2004 and 3/2006
S7.3.2.1	<p>MM5 - Tree Transplantation</p> <ul style="list-style-type: none"> Trees unavoidably affected by the Project works should be transplanted where practical. Trees should be transplanted straight to their final receptor site and not held in a temporary nursery as far as possible. A detailed Tree Transplanting Specification shall be provided in the Contract Specification, where applicable. Sufficient time for necessary tree root and crown preparation periods shall be allowed in the project programme. A detailed transplanting proposal will be submitted to relevant government departments for approval in accordance with ETWBTC 2/2004 and 3/2006 and final 	Transplant Trees where suitable for transplantation	Designer / Contractor	Work Sites where possible. Otherwise consider offsite locations	Prior to construction, construction phase and operation phase	WB TCW No. 10/2013, 3/2006 and 2/2004

EM&A Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concern to Address	Who to implement the measures?	Location of the measure	When to implement the measures?	What requirements or standards for the measure to achieve
Landscape and Visual						
	locations of transplanted trees should be agreed prior to commencement of the work.					
S7.3.2.1	MM17 - Light Control <ul style="list-style-type: none"> Construction day and night time lighting should be controlled to minimize glare impact to adjacent VSRs during the Construction phase. Street and night time lighting shall also be controlled to minimize glare impact to adjacent VSRs during the operation phase. 	To minimize glare impact to adjacent VSRs.	Designer / Contractor	Work Sites and/or the Plant	Construction phase and operation phase	

APPENDIX B


MONTHLY EM&A REPORT FOR CONTRACT NO. DE/2014/01

Jardine Engineering Corporation Ltd.

**Contract No. DE/2014/01
Provision of Electrical and Mechanical Facilities
for Shek Wu Hui Sewage Treatment Works –
Further Expansion Phase 1A –
Advance Works and Ng Chow South Road
Sewage Pumping Station**

**Monthly Environmental
Monitoring and Audit Report
July 2018**

(Version 1.0)

Certified By 
(Environmental Team Leader)

REMARKS:

The information supplied and contained within this report is, to the best of our knowledge, correct at the time of printing.

CINOTECH accepts no responsibility for changes made to this report by third parties

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ABBREVIATION AND ACRONYM

AL Levels	Action and Limit Levels
DSD	Drainage Services Department
E / ER	Engineer/Engineer's Representative
EIA	Environmental Impact Assessment
EM&A	Environmental Monitoring and Audit
EMIS	Environmental Mitigation Implementation Schedule
EP	Environmental Permit
EPD	Environmental Protection Department
ET	Environmental Team
HVS	High Volume Sampler
IEC	Independent Environmental Checker
RE	Resident Engineer
RH	Relative Humidity
QA/QC	Quality Assurance / Quality Control
SLM	Sound Level Meter
WMP	Waste Management Plan
SCISTW	Shek Wu Hui Sewage Treatment Works

EXECUTIVE SUMMARY

Introduction

1. This is the 10th Monthly Environmental Monitoring and Audit (EM&A) Report prepared by Cinotech Consultants Limited for DSD Contract No. DE/2014/01 “Provision of Electrical and Mechanical Facilities for Shek Wu Hui Sewage Treatment Works – Further Expansion Phase 1A – Advance Works and Ng Chow South Road Sewage Pumping Station” (The Project) which documents the key information of EM&A and environmental monitoring works undertaken by other Contract at the Shek Wu Hui Sewage Treatment Works under Phase 1A with Environmental Permit (Permit No. FEP-02/474/2013).
2. The site activities undertaken in the reporting month included:
 - Installation of Building Services at MBR Facilities Building.
 - Mechanical Installation of Air Blowers and associated accessories at 1/F, MBR Facilities Building.
 - Mechanical Installation of MBR Pre-treatment Screen Facilities.
 - Mechanical Installation in Bioreactor No.1 (BR1).
 - Electrical Installation in LV Switchroom and 11kV HV Switchroom at G/F, MBR Facilities Building.
 - Electrical Installation in 3.3kV HV Switchroom and Transformer Room No.2 at 1/F, MBR Facilities Building

Environmental Monitoring Works

3. The environmental monitoring works of the Project were conducted by the ET of Contract DC/2013/09 at the SWHSTW under Phase 1A with same Environmental Permit in accordance with the Updated EM&A Manual for Contract DE/2014/01 which has been submitted and verified by IEC. The current impact monitoring methodology conducted by DC/2013/09 under the requirements of the Updated EM&A Manual for Shek Wu Hui Sewage Treatment Works, are also applicable for the installation works of DE/2014/01 since the two Contracts have shared the same site areas and will execute their works under the same EP.
4. Site audits were conducted once per week. The implementation of the environmental mitigation measures, Event Action Plans and environmental complaint handling procedures were also checked.

5. Summary of the non-compliance of the reporting month is tabulated in **Table I**.

Table I Summary Table for Non-compliance (Exceedances) Recorded in the Reporting Month

Monitored By	Monitoring Station	Parameter	No. of Exceedance		No. of Exceedance Due to the Project		Action Taken
			Action Level	Limit Level	Action Level	Limit Level	
DC/2013/09	AM1	1-hr TSP	0	0	0	0	N/A
		24-hr TSP	0	0	0	0	N/A
	AM2	1-hr TSP	0	0	0	0	N/A
	AM2a	24-hr TSP	0	0	0	0	N/A
	NM1	Noise	0	0	0	0	N/A
	NM2		0	0	0	0	N/A

1-hour TSP Monitoring

6. All 1-hour TSP monitoring was conducted as scheduled in the reporting month. No Action/Limit Level exceedance was recorded.

24-hour TSP Monitoring

7. All 24-hour TSP monitoring was conducted as scheduled in the reporting month. No Action/Limit Level exceedance was recorded.

Construction Noise

8. All construction noise monitoring was conducted as scheduled in the reporting month. No Action/Limit Level exceedance was recorded.

Environmental Licenses and Permits

9. Licenses/Permits granted to Shek Wu Hui Sewage Treatment Works - Further Expansion Phase 1A include the Environmental Permit (EP no. FEP-02/474/2013); Registered as a Chemical Waste Producer and Billing account for Disposal of Construction Waste for the Project.

Environmental Mitigation Implementation Schedule

10. According to the Updated EM&A Manual, air quality, noise and waste management would be the key environmental issues and mitigation measures shall be implemented during the construction phase. Details of the implementation of mitigation measures are provided in the **Appendix F**.

Key Information in the Reporting Month

11. Summary of key information in the reporting month is tabulated in **Table II**

Table II Summary Table for Key Information in the Reporting Month

Event	Event Details		Action Taken	Status	Remark
	Number	Nature			
Complaint received	0	---	N/A	N/A	---
Reporting Changes	---	---	---	---	---
Notifications of any summons & prosecutions received	0	---	N/A	N/A	---

Site Inspection Conducted by Government Department

12. No site inspection for Contract DE/2014/01 was conducted by Government Department in the reporting month.

Summary of Complaints, Prosecutions, Reporting Changes and Notification of Summons

13. No environmental complaint, prosecution, reporting changes and notification of summons were received or reported for the Project in the reporting month.
14. There were no environmental complaint and prosecution received since the commencement

of the Project. The Complaint Log is presented in **Appendix G**.

15. No notification of summons and prosecution was received by the Contractor in the reporting month.

Future Key Issues

16. Key issues to be considered in the coming month for the Contract include:

Table III Future Key Issue for the next Reporting Month

Major Construction Works	Potential Pollution Issues	Mitigation Measures
<ul style="list-style-type: none"> • Electrical Installation in LV Switchroom and 11kV HV Switchroom at G/F, MBR Facilities Building. • Electrical Installation in 3.3kV HV Switch room and Transformer Room No.2 at 1/F, MBR Facilities Building. • Electrical Installation in LV Switchroom No.3. • Mechanical Installation of Air Blowers and associated accessories at 1/F, MBR Facilities Building. • Mechanical Installation of MBR Pre-treatment Screen Facilities. • Mechanical Installation of Bioreactor No.1 (BR1). • Mechanical Installation in Chemical Rooms. 	<ul style="list-style-type: none"> • Storage of chemicals containers. • Waste accumulation. • Silt and dust getting into the public area by the leaving site vehicles at the site exits without adequate wheel washing facilities. 	<ul style="list-style-type: none"> • Drip tray should be provided to chemical containers. • Waste should be disposed properly and avoid accumulation. • Accumulated materials to be recycled on-site. • Wheel washing should be provided to vehicles before leaving the site area.

1. INTRODUCTION

Background

- 1.1 The Project ‘Provision of Electrical and Mechanical Facilities for Shek Wu Hui Sewage Treatment Works – Further Expansion Phase 1A – Advance Works and Ng Chow South Road Sewage Pumping Station’ under Contract No: DE/2014/01 mainly comprises the Design, manufacture, supply, delivery, installation, inspection, testing and commissioning of E&M installations for the Advance Works in the SWHSTW. The general location plan of the Project is shown in **Figure 1**.
- 1.2 The Project is under North East New Territories New Development Areas and is part of the designated project with Register No. : AEIAR-175/2013. The current works under the Project and other Contracts at SWHSTW are covered by the Environmental Permit (Permit No. FEP-02/474/2013), which was issued on 15th February 2018 by the Environmental Protection Department (hereinafter called EPD) to the Drainage Services Department (hereinafter called the DSD) as the Permit Holder.
- 1.3 The environmental monitoring works on air quality and noise were covered by the ET of Contract DC/2013/09 for the Project.
- 1.4 The Jardine Engineering Corporation, Limited was commissioned by the DSD to undertake the construction of the Contract No. DE/2014/01 “Provision of Electrical and Mechanical Facilities for Shek Wu Hui Sewage Treatment Works – Further Expansion Phase 1A – Advance Works and Ng Chow South Road Sewage Pumping Station”.
- 1.5 The site activities undertaken in the reporting month included:
- Installation of Building Services at G/F, MBR Facilities Building.
 - Mechanical Installation of Air Blowers and associated accessories at 1/F, MBR Facilities Building.
 - Mechanical Installation of MBR Pre-treatment Screen Facilities.
 - Mechanical Installation of Bioreactor No.1 (BR1).
 - Electrical Installation in 3.3kV HV Switchroom and Transformer Room No.2 at 1/F, MBR Facilities Building.
 - Electrical Installation in LV Switchroom and 11kV HV Switchroom at G/F, MBR Facilities Building.
- 1.6 Cinotech Consultants Limited was commissioned and appointed by The Jardine Engineering Corporation Limited as the Environmental Team (ET) of Contract No. DE/2014/01 under Condition 2.1 of the FEP. The Environmental Monitoring and Audit (EM&A) works were conducted and reported during the reporting month according to the Updated EM&A Manual of this designated project.
- 1.7 This is the 10th monthly EM&A report summarizing the EM&A works conducted for the Project in July 2018.

Project Organizations

- 1.8 The contacts of the Project are shown in **Table 1.1** and the Project Organization Chart is shown in **Figure 4**.

Table 1.1 Key Project Contacts

Party	Role	Name	Position	Phone No.
Drainage Service Department	Resident Site Engineer	Mr. Fong Mo	Resident Engineer	2594 7329
Cinotech	Environmental Team	Dr. Priscilla Choy	ET Leader	2151 2089
ANewR	Independent Environmental Checker	Mr. Adi Lee	Independent Environmental Checker	2618 2836
The Jardine Engineering Corporation, Limited	Contractor	Mr. Kim Hung Lau	Project Manager	2947 1125
		Mr. George Ng	Environmental Officer	2947 1125

Summary of EM&A Requirements

- 1.9 The EM&A programme requires construction phase monitoring for air quality and construction noise, landscape and visual and environmental site audit. The EM&A requirements for each parameter are described in the following sections, including:
- All monitoring parameters;
 - Action and Limit levels for all environmental parameters;
 - Event Action Plans;
 - Environmental mitigation measures, as recommended in the project EIA study final report; and
 - Environmental requirements in contract documents.
- 1.10 The advice on the implementation status of environmental protection and pollution control/mitigation measures is summarized in **Section 4** of this report.
- 1.11 This report presents the monitoring results, observations, locations, equipment, period, for required monitoring parameter namely air quality, noise and audit works conducted for the Project during this reporting month. For the methodology and QA/QC procedures of the monitoring parameters, please refer to the respective monthly reports for the other contract at SWHSTW.

2. AIR QUALITY

Monitoring Requirements

- 2.1 1-hour and 24-hour TSP monitoring were conducted to monitor the air quality. **Appendix A** shows the established Action/Limit Levels for the environmental monitoring works.

Monitoring Locations

- 2.2 Three designated monitoring stations, AM1, AM2 and AM2a were selected for impact dust monitoring for the Project. **Table 2.1** describes the air quality monitoring locations and **Figure 2** indicated their positions in relation to the site boundary.

Table 2.1 Locations for Air Quality Monitoring

Monitoring Station	Monitored by	Location of Measurement
AM1	DC/2013/09	No. 31 Wai Loi Tsuen
AM2		Fu Tei Au
AM2a		RE's Site Office

Monitoring Equipment

- 2.3 The details of the monitoring equipment and copies of the calibration certificates used during the reporting month could be referred to the monthly EM&A reports of Contract DC/2013/09.

Monitoring Parameters, Frequency and Duration

- 2.4 **Table 2.2** summarizes the monitoring parameters and frequencies of impact dust monitoring for the whole construction period. The air quality monitoring schedule for the reporting period could refer to the respective monthly reports.

Table 2.2 Impact Dust Monitoring Parameters, Frequency and Duration

Monitoring Station	Parameter	Period	Frequency
AM1	1-hour TSP	0700-1900 hrs	At least three times every 6 days
AM2			
AM1	24-hour TSP	0000-2400 hrs	At least once every 6 days
AM2a			

Monitoring Methodology and QA/QC Procedure

- 2.5 The monitoring methodology and QA/QC procedure could be referred to the monthly report of Contract DC/2013/09.

Results and Observations

- 2.6 The monitoring results at AM1, AM2 and AM2a in reporting month could be referred to the monthly report of Contract DC/2013/09. The monitoring results has been checked by the ET of Contract DC/2013/09 and verified by the IEC.

- 2.7 All 1-hour TSP monitoring was conducted as scheduled in the reporting month. No Action/Limit Level exceedance was recorded. Summary of exceedance is presented in **Appendix B**.
- 2.8 All 24-hour TSP monitoring was conducted as scheduled in the reporting month. No Action/Limit Level exceedance was recorded. Summary of exceedance is presented in **Appendix B**.
- 2.9 The monitoring data and graphical presentations of 1-hour and 24-hour TSP monitoring results could be referred to Appendix I and Appendix J of the monthly report of Contract DC/2013/09.
- 2.10 According to field observations during site inspection, identifiable dust sources near the monitoring stations were mainly from construction works and vehicles movement operating for the Project.

3. NOISE

Monitoring Requirements

- 3.1 Two noise monitoring station, namely NM1 and NM2 were designated in the Updated EM&A Manual for impact monitoring. **Appendix A** shows the established Action and Limit Levels for the environmental monitoring works.

Monitoring Locations

- 3.2 Noise monitoring was conducted at the designated monitoring stations as listed in **Table 3.1** and **Figure 3** indicated their positions in relation to the site boundary

Table 3.1 Location of Noise Monitoring Stations

Monitoring Station	Monitored By	Location of Measurement
NM1	DC/2013/09	No. 31 Wai Loi Tsuen
NM2		Fu Tei Au

Monitoring Equipment

- 3.3 The details of the monitoring equipment and copies of the calibration certificates used during the reporting month could be referred to the monthly EM&A reports of Contract DC/2013/09.

Monitoring Parameters, Frequency and Duration

- 3.4 **Table 3.2** summarizes the monitoring parameters, frequency and total duration of monitoring. The noise monitoring schedule for the reporting period could refer to the respective monthly reports.

Table 3.2 Noise Monitoring Parameters, Frequency and Duration

Monitoring Stations	Parameter	Period	Frequency
NM1	L ₁₀ (30 min.) dB(A) L ₉₀ (30 min.) dB(A) L _{eq} (30 min.) dB(A)	0700-1900 hrs on normal weekdays	Once per week
NM2			

Monitoring Methodology and QA/QC Procedures

- 3.5 The monitoring methodology and QA/QC procedure could be referred to the monthly report of Contract DC/2013/09.

Results and Observations

- 3.6 The monitoring results at NM1 and NM2 in the reporting month could be referred to the monthly report of Contract DC/2013/09. The monitoring results has been checked by the ET of Contract DC/2013/09 and verified by the IEC.

- 3.7 The monitoring results and graphical presentations could be referred to Appendix I and Appendix J of the monthly report of Contract DC/2013/09.
- 3.8 No Action/Limit Level exceedance was recorded in the reporting month. Summary of exceedance is presented in **Appendix B**.
- 3.9 The major noise sources identified at the designated noise monitoring stations were mainly from construction works and vehicles movement operating for the Project.

4. ENVIRONMENTAL AUDIT

Site Audits

- 4.1 Site audits were carried out on a weekly basis to monitor the timely implementation of proper environmental management practices and mitigation measures in the Project site. The summaries of site audits are attached in **Appendix C**.
- 4.2 Site audits were conducted on 5, 13, 19, 26 and 31 July 2018 by ET after the commencement of construction works for the Contract. A joint site audit with the representative of IEC was carried out on 31 July 2018. The details of observations during site audit can refer to **Table 4.1**.

Implementation Status of Environmental Mitigation Measures

- 4.3 Details of the implementation of mitigation measures are provided in the **Appendix F**.
- 4.4 During the weekly environmental site inspections in the reporting period, no non-conformance was identified. The observations of the site audit for the Projects are summarized in **Table 4.1**.

Table 4.1 Observations of Site Audit

Parameters	Date	Ref. Number	Observations	Follow Up Action
Water Quality	N/A	N/A	--	--
Air Quality	N/A	N/A	--	--
Noise	N/A	N/A	--	--
Waste/ Chemical Management	N/A	N/A	--	--
Permit/ Licenses	N/A	N/A	--	--

Review of Environmental Monitoring Procedures

- 4.5 The monitoring works was conducted by the monitoring teams of Contracts DC/2013/09. The monitoring procedures were reviewed by its respective ET.

Status of Environmental Licensing and Permitting

- 4.6 All permits/licenses obtained for the Contract DE/2014/01 are summarized in **Table 4.2**.

Table 4.2 Summary of Environmental Licensing and Permit Status

Permit No.	Valid Period		Details	Status
	From	To		
Environmental Permit				
FEP-02/474/2013	15/2/2018	N/A	The FEP was approved on 15/2/2018	Valid
Registered Chemical Waste Producer				
WPN5213-624-T3685-01	3/7/2017	N/A	The application was approved on 3/7/2017	Valid
Billing Account for Disposal of Construction Waste				
A/C No.7024165	4/2/2016	N/A	The application was approved on 4/2/2016	Valid

Status of Waste Management

- 4.7 The amount of wastes generated by the activities of the Project in the reporting month is shown in **Appendix D and Table 4.3**.

Table 4.3 Quantities of Waste Generated from the Reporting Month

Type of waste		Quantity	Disposal Location
C&D Materials (inert)		0 m ³	-
C&D Materials (non-inert)	General Refuse	4.63 tonne	NENT
	Chemical Waste	0 kg	-
	Paper/ cardboard	0 kg	-
	Plastics	0 kg	-
	Metals	0 kg	-

Implementation Status of Event Action Plans

- 4.8 The Event Action Plans for air quality and noise are presented in **Appendix E**.

1-hr TSP

- 4.9 No Action/Limit Level exceedance was recorded.

24-hr TSP

- 4.10 No Action/Limit Level exceedance was recorded.

Construction Noise

- 4.11 No Action/Limit Level exceedance was recorded.

Landscape and Visual

- 4.12 No non-compliance was recorded.

Site Inspection Conducted by Government Department

- 4.13 No site inspection for Contract DE/2014/01 was conducted by Government Department in the reporting month.

Summary of Complaints, Prosecutions, Reporting Changes and Notification of Summons

- 4.14 No environmental complaint, prosecution, reporting changes and notification of summons were received or reported for the Project in the reporting month.
- 4.15 There were no environmental complaint and prosecution received since the commencement of the Project. The Complaint Log is presented in **Appendix G**.

5. FUTURE KEY ISSUES

Key Issues for the Coming Month

5.1 Key issues to be considered in the coming month for the Contract include:

Table 5.1 Future Key Issue for the next Reporting Month

Major Construction Works	Potential Pollution Issues	Mitigation Measures
<ul style="list-style-type: none"> Electrical Installation in LV Switchroom and 11kV HV Switchroom at G/F, MBR Facilities Building. Electrical Installation in 3.3kV HV Switch room and Transformer Room No.2 at 1/F, MBR Facilities Building. Electrical Installation in LV Switchroom No.3. Mechanical Installation of Air Blowers and associated accessories at 1/F, MBR Facilities Building. Mechanical Installation of MBR Pre-treatment Screen Facilities. Mechanical Installation of Bioreactor No.1 (BR1). Mechanical Installation in Chemical Rooms. 	<ul style="list-style-type: none"> Storage of chemicals containers. Waste accumulation. Silt and dust getting into the public area by the leaving site vehicles at the site exits without adequate wheel washing facilities. 	<ul style="list-style-type: none"> Drip tray should be provided to chemical containers. Waste should be disposed properly and avoid accumulation. Accumulated materials to be recycled on-site. Wheel washing should be provided to vehicles before leaving the site area.

Monitoring Schedule for the Next Month

5.2 The tentative environmental monitoring schedules for the next reporting month are shown in the monthly reports of Contract DC/2013/09 (Appendix H).

Construction Program for the Next Month

5.3 The tentative construction program is provided in **Appendix H**.

6. CONCLUSIONS AND RECOMMENDATIONS

Conclusions

- 6.1 Environmental monitoring and audit works were performed in the reporting month for the Project. The results were checked and reviewed by the ET of Contract DC/2013/09.

1-hour TSP Monitoring

- 6.2 The monitoring works for the Project were covered by the ET of Contract DC/2013/09. All 1-hour TSP monitoring was conducted as scheduled in the reporting month. No Action/Limit Level exceedance was recorded.

24-hour TSP Monitoring

- 6.3 The monitoring works for the Project were covered by the ET of Contract DC/2013/09. All 24-hour TSP monitoring was conducted as scheduled in the reporting month. No Action/Limit Level exceedance was recorded.

Construction Noise Monitoring

- 6.4 The monitoring works for the Project were covered by the ET of Contract DC/2013/09. All Construction Noise monitoring was conducted as scheduled in the reporting month. No Action/Limit Level exceedance was recorded.

Environmental Audit

- 6.5 Weekly environmental site audits were conducted by the ET of Contract No. DE/2014/01 at the site area of Contract No. DE/2014/01 during the reporting month. No non-compliance was recorded.

Complaint, notification of summons and Prosecution

- 6.6 No environmental complaint, notification of summons and prosecution was received in the reporting month.

Recommendations for Future Reporting Months:

- 6.7 The following recommendations were made for future reporting months:

Air Quality

- To regularly maintain the machinery and vehicles on site;
- To follow up any exceedance caused by the construction works;
- Non-Road Mobile Machinery (NRMM) labels must be demonstrated on the registered equipment for inspection.

Noise

- To inspect the noise source inside the site;

- To follow up any exceedance caused by the construction works;
- To space out noisy equipment and position the equipment as far away as possible from sensitive receivers;
- To provide temporary noise barriers for operations of noisy equipment near the noise sensitive receivers in an appropriate location.
- To provide adequate lubricant on mechanical equipment to reduce frictional noise; and
- To well maintain the mechanical equipment/ machineries to avoid abnormal noise nuisance.

Water Quality

- To identify any discharge of wastewater from the construction site;
- To avoid blockage of U channel and drainage system by sediment;
- To avoid water accumulation on site and carry out larviciding against mosquito breeding for stagnant water when mosquito larvae are observed; and
- To avoid spoilage of run-off from construction site to public area.
- The discharge quality must meet the requirements specified in the discharge licence.

Waste/Chemical Management

- To provide proper rubbish bins / skips for waste collection;
- To check for any accumulation of wasted materials or rubbish on site;
- To provide proper storage area or drip trays for oil and chemical containers on site;
- To avoid any discharge or accidental spillage of chemical waste or oil directly from the equipment;
- To avoid improper handling or storage of oil drum on site.

FIGURES

NOTES :

1. GENERAL NOTES REFER TO DRAWING AND SUPPLEMENTARY NOTES.
2. WORKING AREA TO BE MAINTAINED AND NOT TO BE DISTURBED.
3. WORKING AREA TO BE MAINTAINED AND NOT TO BE DISTURBED.
4. WORKING AREA TO BE MAINTAINED AND NOT TO BE DISTURBED.
5. WORKING AREA TO BE MAINTAINED AND NOT TO BE DISTURBED.



WORKING AREA OF ADVANCE WORKS

REV.	DATE	DESCRIPTION	BY	CHECKED
1	11 NOV 2015	ISSUE FOR PERMIT	Y. T. CHAN	22 APR 2016
2	01 DEC 2015	REVISED	Y. T. CHAN	22 APR 2016
3	01 DEC 2015	REVISED	Y. T. CHAN	22 APR 2016
4	01 DEC 2015	REVISED	Y. T. CHAN	22 APR 2016
5	01 DEC 2015	REVISED	Y. T. CHAN	22 APR 2016

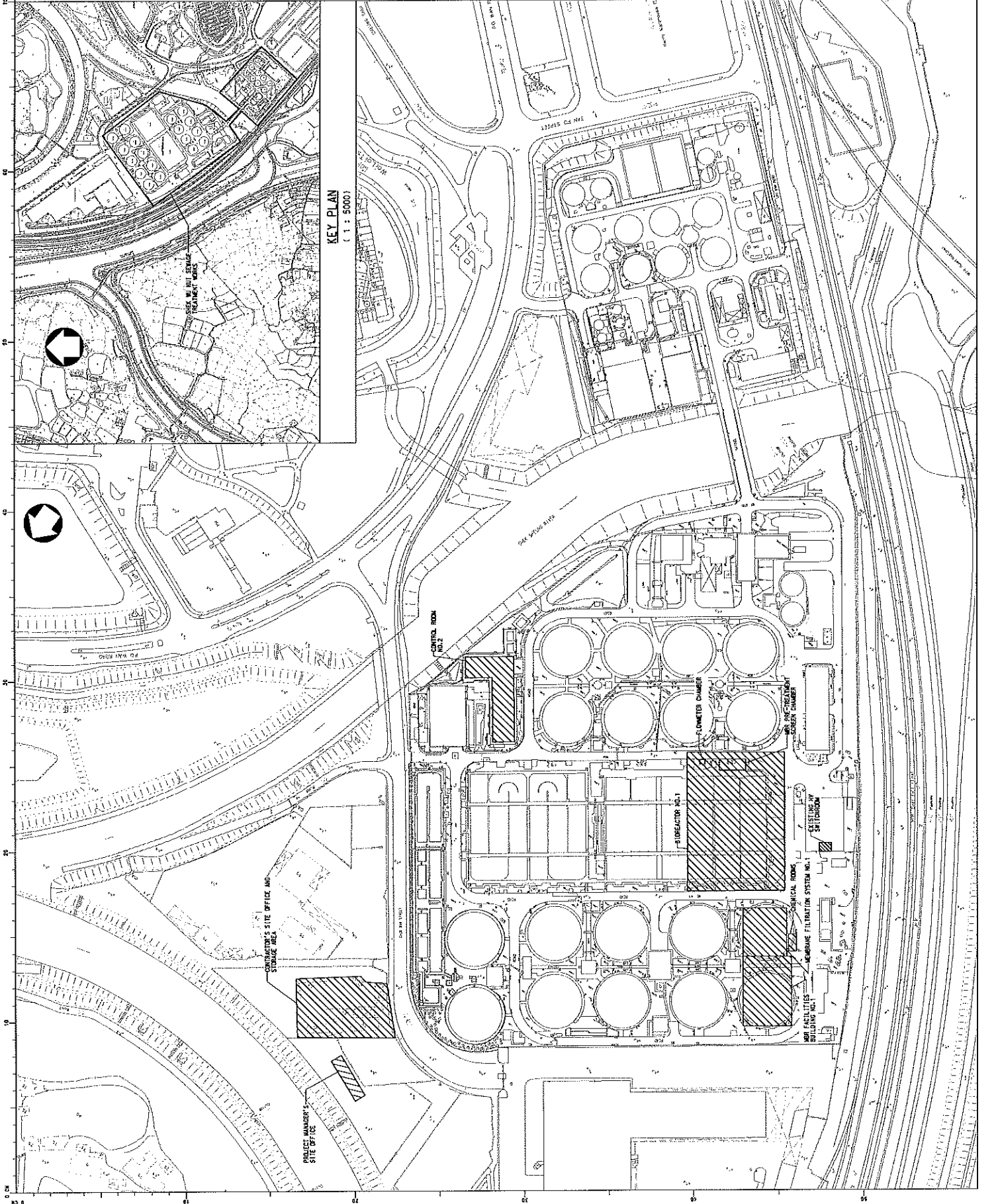
PROJECT NO. DEM1619/AM2
 CONTRACT NO. 40800 AND 40801
 DRAWING TITLE
 KEY PLAN AND LOCATION PLAN

PROVISION OF ELECTRICAL AND MECHANICAL WORKS FOR THE FURTHER EXPANSION OF PHASE 1A - ADVANCE WORKS AND NG CROW SOUTH ROAD SEWAGE PUMPING STATION

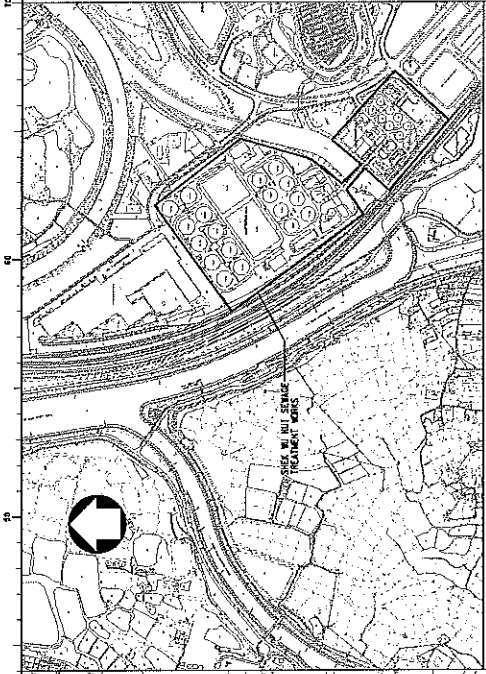
SCALE: 1:1,000 OR AS SHOWN
 DRAWING NO. DEM1619/AM2

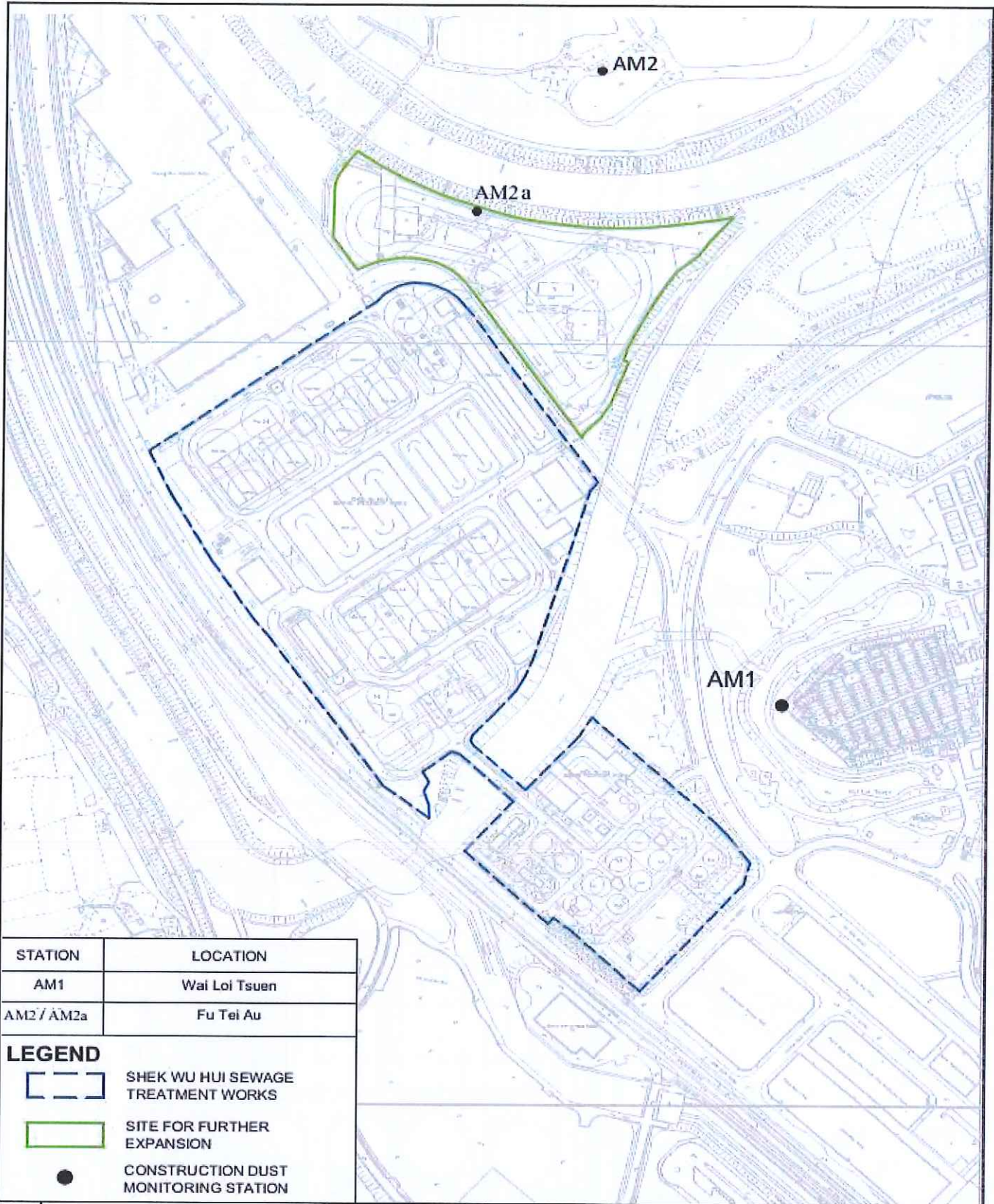
OFFICE: ELECTRICAL AND MECHANICAL PROJECTS DIVISION

PRINICIPAL ENGINEER: [Signature]
 SPECIAL ADMINISTRATIVE REGION



KEY PLAN
(1 : 5000)



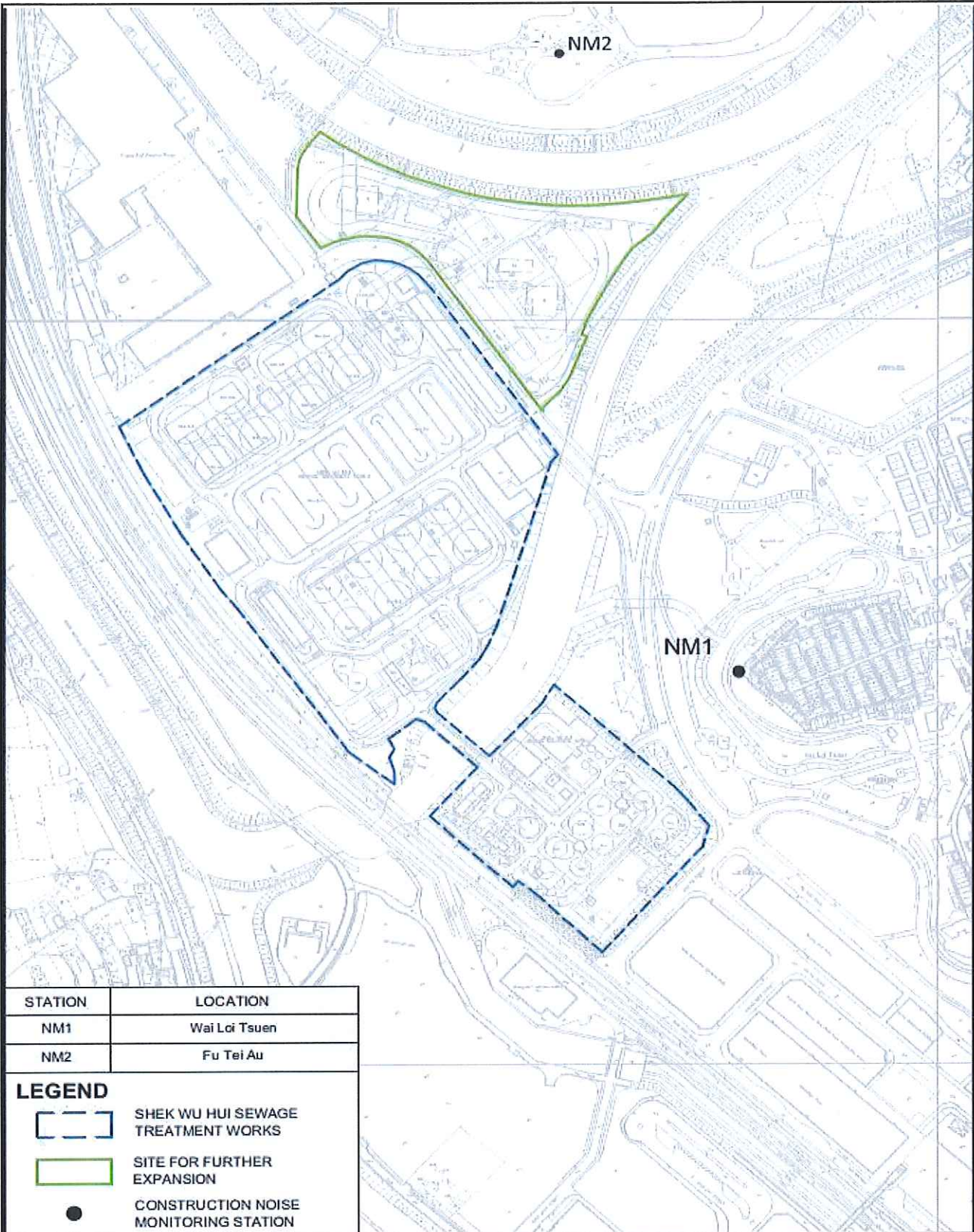


STATION	LOCATION
AM1	Wai Loi Tsuen
AM2 / AM2a	Fu Tei Au

LEGEND

	SHEK WU HUI SEWAGE TREATMENT WORKS
	SITE FOR FURTHER EXPANSION
	CONSTRUCTION DUST MONITORING STATION

Title	Contract No. DE/2014/01	Scale	Project No.	CINOTECH
	Provision of Electrical and Mechanical Facilities for Shek Wu Hui Sewage Treatment Works – Further Expansion Phase 1A – Advance Works and Ng Chow South Road Sewage Pumping Station	N.T.S	MA16002	
	Locations of Impact Air Quality Monitoring Stations	Date	Figures	
		Oct-17	2	



STATION	LOCATION
NM1	Wai Lai Tsuen
NM2	Fu Tei Au

LEGEND

	SHEK WU HUI SEWAGE TREATMENT WORKS
	SITE FOR FURTHER EXPANSION
	CONSTRUCTION NOISE MONITORING STATION

Title	Contract No. DE/2014/01	Scale	Project No.
	Provision of Electrical and Mechanical Facilities for Shek Wu Hui Sewage Treatment Works – Further Expansion Phase 1A – Advance Works and Ng Chow South Road Sewage Pumping Station	N.T.S	MA16002
	Locations of Impact Noise Monitoring Stations	Date	Figures
		Oct-17	3



Environmental Team Leader
Dr. Priscilla Choy
 (Tel: 2151 2089)

Project Coordinator
 - coordination of the Project and compile reports
Jonathan Lee
 (Tel: 2151 2035)

Monitoring Team
 - perform environmental monitoring works

Team Leader: Tang Wing Kwai
 (Tel: 2151 2087)

Team Members: Lee Man Hei, Mo Yik Wai, Lam Ho Chun, Fung Ka Chun, Law Chun Hong, Ho Ka Chun, Chan Ping Fai, Sin Kin Chung, Lau Kong Yung, Lam Cheuk Fung

Audit Team

- conduct site inspection, complete the environmental checklist once a week

Team Leader: Ivy Tam
 (Tel: 2151 2090)

Team Members: Jonathan Lee, Victor Wong

Title

Contract No. DE/2014/01
 Provision of Electrical and Mechanical Facilities for Shek Wu Hui Sewage Treatment Works – Further Expansion Phase 1A – Advance Works and Ng Chow South Road Sewage Pumping Station
 ET's Organization Chart

Scale

N.T.S

Project No.

MA16002

Version

v.1

Figure

4

CINOTECH

**APPENDIX A
ACTION AND LIMIT LEVELS FOR AIR
QUALITY AND NOISE**

Appendix A Action and Limit Levels

Table A-1 Action and Limit Levels for 1-Hour TSP and 24-Hour TSP

Monitoring Stations	Action Level ($\mu\text{g}/\text{m}^3$)		Limit Level ($\mu\text{g}/\text{m}^3$)	
	1-hour	24-hour	1-hour	24-hour
AM1	286	147	500	260
AM2	276	N/A	500	N/A
AM2a	N/A	155	N/A	260

Table A-2 Action and Limit Level for Construction Noise

Monitoring Stations	Time Period	Action Level	Limit Level in dB(A)
NM1	0700-1900 hours on normal weekdays	When one documented complaint is received	>75*
NM2			

Note: (*) Reduces to 70 dB(A) for schools and 65 dB(A) during the school examination periods.

**APPENDIX B
SUMMARY OF EXCEEDANCE**

APPENDIX B – SUMMARY OF EXCEEDANCE

Reporting Month: July 2018

- a) Exceedance Report for 1-hr TSP (NIL)**
- b) Exceedance Report for 24-hr TSP (NIL)**
- c) Exceedance Report for Construction Noise (NIL)**

APPENDIX C
SITE AUDIT SUMMARY

Contract No: DE/2014/01

Provision of Electrical and Mechanical Facilities for Shek Wu Hui Sewage Treatment Works - Further Expansion Phase 1A - Advance Works and Ng Chow South Road Sewage Pumping Station

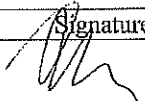
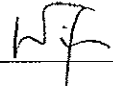
Record Summary of Environmental Site Inspection

Inspection Information

Checklist Reference Number	180705
Date	5 July 2018 (Thursday)
Time	4:00-5:00

Ref. No.	Non-Compliance	Related Item No.
-	None identified	-

Ref. No.	Remarks/Observations	Related Item No.
	<p><i>Part C - Water Quality</i></p> <ul style="list-style-type: none">• No environmental deficiency was identified during the site inspection. <p><i>Part D - Air Quality</i></p> <ul style="list-style-type: none">• No environmental deficiency was identified during the site inspection. <p><i>Part E - Construction Noise Impact</i></p> <ul style="list-style-type: none">• No environmental deficiency was identified during the site inspection. <p><i>Part F - Waste / Chemical Management</i></p> <ul style="list-style-type: none">• No environmental deficiency was identified during the site inspection. <p><i>Part G - Permit / Licenses</i></p> <ul style="list-style-type: none">• No environmental deficiency was identified during the site inspection. <p><i>Others / Remarks</i></p> <ul style="list-style-type: none">• Follow-up on previous audit session (Ref. No.: 180628), no major environmental deficiency was identified by the Contractor.	

	Name	Signature	Date
Recorded by	Jonathan Lee		6 July 2018
Checked by	Dr. Priscilla Choy		6 July 2018

Contract No: DE/2014/01

Provision of Electrical and Mechanical Facilities for Shek Wu Hui Sewage Treatment Works - Further Expansion Phase 1A - Advance Works and Ng Chow South Road Sewage Pumping Station

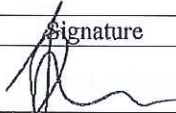
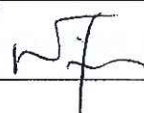
Record Summary of Environmental Site Inspection

Inspection Information

Checklist Reference Number	180713
Date	13 July 2018 (Friday)
Time	4:00-5:00

Ref. No.	Non-Compliance	Related Item No.
-	None identified	..

Ref. No.	Remarks/Observations	Related Item No.
	<p><i>Part C - Water Quality</i></p> <ul style="list-style-type: none">• No environmental deficiency was identified during the site inspection. <p><i>Part D - Air Quality</i></p> <ul style="list-style-type: none">• No environmental deficiency was identified during the site inspection. <p><i>Part E - Construction Noise Impact</i></p> <ul style="list-style-type: none">• No environmental deficiency was identified during the site inspection. <p><i>Part F - Waste / Chemical Management</i></p> <ul style="list-style-type: none">• No environmental deficiency was identified during the site inspection. <p><i>Part G - Permit / Licenses</i></p> <ul style="list-style-type: none">• No environmental deficiency was identified during the site inspection. <p><i>Others / Remarks</i></p> <ul style="list-style-type: none">• Follow-up on previous audit session (Ref. No.: 180705), no major environmental deficiency was observed.	

	Name	Signature	Date
Recorded by	Jonathan Lee		16 July 2018
Checked by	Dr. Priscilla Choy		16 July 2018

Contract No: DE/2014/01

Provision of Electrical and Mechanical Facilities for Shek Wu Hui Sewage Treatment Works - Further Expansion Phase 1A - Advance Works and Ng Chow South Road Sewage Pumping Station

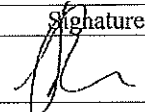
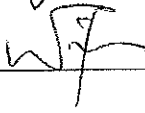
Record Summary of Environmental Site Inspection

Inspection Information

Checklist Reference Number	180719
Date	19 July 2018 (Thursday)
Time	9:45-10:45

Ref. No.	Non-Compliance	Related Item No.
-	None identified	-

Ref. No.	Remarks/Observations	Related Item No.
	<p>Part C - Water Quality</p> <ul style="list-style-type: none">• No environmental deficiency was identified during the site inspection. <p>Part D - Air Quality</p> <ul style="list-style-type: none">• No environmental deficiency was identified during the site inspection. <p>Part E - Construction Noise Impact</p> <ul style="list-style-type: none">• No environmental deficiency was identified during the site inspection. <p>Part F - Waste / Chemical Management</p> <ul style="list-style-type: none">• No environmental deficiency was identified during the site inspection. <p>Part G - Permit / Licenses</p> <ul style="list-style-type: none">• No environmental deficiency was identified during the site inspection. <p>Others / Remarks</p> <ul style="list-style-type: none">• Follow-up on previous audit session (Ref. No.: 180713), no major environmental deficiency was observed.	

	Name	Signature	Date
Recorded by	Jonathan Lee		20 July 2018
Checked by	Dr. Priscilla Choy		20 July 2018

Contract No: DE/2014/01

Provision of Electrical and Mechanical Facilities for Shek Wu Hui Sewage Treatment Works - Further Expansion Phase 1A - Advance Works and Ng Chow South Road Sewage Pumping Station


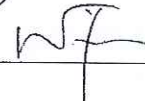
Record Summary of Environmental Site Inspection

Inspection Information

Checklist Reference Number	180726
Date	26 July 2018 (Thursday)
Time	04:00-05:30

Ref. No.	Non-Compliance	Related Item No.
-	None identified	-

Ref. No.	Remarks/Observations	Related Item No.
	<p>Part C - Water Quality</p> <ul style="list-style-type: none">• No environmental deficiency was identified during the site inspection. <p>Part D - Air Quality</p> <ul style="list-style-type: none">• No environmental deficiency was identified during the site inspection. <p>Part E - Construction Noise Impact</p> <ul style="list-style-type: none">• No environmental deficiency was identified during the site inspection. <p>Part F - Waste / Chemical Management</p> <ul style="list-style-type: none">• No environmental deficiency was identified during the site inspection. <p>Part G - Permit / Licenses</p> <ul style="list-style-type: none">• No environmental deficiency was identified during the site inspection. <p>Others / Remarks</p> <ul style="list-style-type: none">• Follow-up on previous audit session (Ref. No.: 180719), no major environmental deficiency was observed.	

	Name	Signature	Date
Recorded by	Jonathan Lee		27 July 2018
Checked by	Dr. Priscilla Choy		27 July 2018

Contract No: DE/2014/01

Provision of Electrical and Mechanical Facilities for Shek Wu Hui Sewage Treatment Works - Further Expansion Phase 1A - Advance Works and Ng Chow South Road Sewage Pumping Station

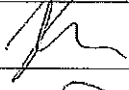
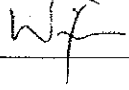
Record Summary of Environmental Site Inspection

Inspection Information

Checklist Reference Number	180731
Date	31 July 2018 (Tuesday)
Time	09:30-11:00

Ref. No.	Non-Compliance	Related Item No.
-	None identified	-

Ref. No.	Remarks/Observations	Related Item No.
	<p><i>Part C - Water Quality</i></p> <ul style="list-style-type: none">• No environmental deficiency was identified during the site inspection. <p><i>Part D - Air Quality</i></p> <ul style="list-style-type: none">• No environmental deficiency was identified during the site inspection. <p><i>Part E - Construction Noise Impact</i></p> <ul style="list-style-type: none">• No environmental deficiency was identified during the site inspection. <p><i>Part F - Waste / Chemical Management</i></p> <ul style="list-style-type: none">• No environmental deficiency was identified during the site inspection. <p><i>Part G - Permit / Licenses</i></p> <ul style="list-style-type: none">• No environmental deficiency was identified during the site inspection. <p><i>Others / Remarks</i></p> <ul style="list-style-type: none">• Follow-up on previous audit session (Ref. No.: 180726), no major environmental deficiency was observed.	

	Name	Signature	Date
Recorded by	Jonathan Lee		31 July 2018
Checked by	Dr. Priscilla Choy		31 July 2018

**APPENDIX D
SUMMARY OF THE AMOUNT OF
WASTE GENERATED**

Monthly Summary Waste Flow Table for 2018

Month	Annual Quantities of Inert C&D Materials Generated Monthly					Annual Quantities of C&D Materials Generated Monthly					
	Total Quantity Generated (in '000m ³)	Hard Rock & Large Broken Concrete (in '000m ³)	Reused in the Contract (in '000m ³)	Reused in other Projects (in '000m ³)	Disposed as Public Fill (in '000m ³)	Imported Fill (in '000m ³)	Metals (in '000 kg)	Paper/ cardboard packaging (in '000 kg)	Plastics (see Note 3) (in '000 kg)	Chemicals Waste (in '000 kg)	Others, e.g. general refuse (in '000 kg)
Jan	0	0	0	0	0	0	0	0	0	0	0
Feb	0	0	0	0	0	0	0	0	0	0	1.00
Mar	0	0	0	0	0	0	0	0	0	0	0
Apr	0	0	0	0	0	0	0	0	0	0	7.16
May	0	0	0	0	0	0	0	0	0	0	5.31
June	0	0	0	0	0	0	0	0	0	0	8.24
Sub-total	0	0	0	0	0	0	0	0	0	0	21.71
July	0	0	0	0	0	0	0	0	0	0	4.63
Aug											
Sept											
Oct											
Nov											
Dec											
Total	0	0	0	0	0	0	0	0	0	0	26.34

Forecast of Total Quantities of C&D Materials to be Generated from the Contractor

Total Quantity Generated (in '000 m ³)	Hard Rock & Large Broken Concrete (in '000 m ³)	Reused in the Contract (in '000 m ³)	Reused in other Projects (in '000 m ³)	Disposed as Public Fill (in '000 m ³)	Imported Fill (in '000 m ³)	Metals (in '000 kg)	Paper/ cardboard packaging (in '000 kg)	Plastics (see Note 3) (in '000 kg)	Chemicals Waste (in '000 kg)	Others, e.g. general refuse (in '000 kg)
0	0	0	0	0	0	0	1	1	0.5	30

Notes: (1) The performance targets are given in PS Clause 6.21.8(14).

(2) The waste flow table shall also include C&D materials that are specified in the Contract to be imported for use at the Site.

(3) Plastics refer to plastic bottles/containers, plastic sheets/foam from packaging material.

The Contractor shall also submit the latest forecast of the total amount of C&D materials expected to be generated from the Works, together with a breakdown of the nature where the total amount of C&D materials expected to be generated from the Works is equal to or exceeding 50,000 m³. (PS Clause 6.21.7(4)(b) refers).

APPENDIX E
EVENT ACTION PLANS

APPENDIX E – Event / Action Plans
 Table E-1 Event / Action Plan For Air Quality

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

ACTION		CONTRACTOR		
EVENT	ET	IEC	ER	CONTRACTOR
LIMIT LEVEL				
1. Exceedance for one sample	<ol style="list-style-type: none"> 1. Identify source, investigate the causes of exceedance and propose remedial measures; 2. Inform Contractor ,IEC, ER, and EPD; 3. Repeat measurement to confirm finding; 4. Increase monitoring frequency to daily; 5. Assess effectiveness of Contractor's remedial actions and keep IEC, EPD and ER informed of the results. 	<ol style="list-style-type: none"> 1. Check monitoring data submitted by ET; 2. Check Contractor's working method; 3. Discuss with ET and Contractor on possible remedial measures; 4. Advise the ER on the effectiveness of the proposed remedial measures; 5. Supervise implementation of remedial measures 	<ol style="list-style-type: none"> 1. Confirm receipt of notification of failure in writing; 2. Notify Contractor; 3. Ensure remedial measures properly implemented 	<ol style="list-style-type: none"> 1. Take immediate action to avoid further exceedance; 2. Submit proposals for remedial actions to IEC within 3 working days of notification; 3. Implement the agreed proposals; 4. Amend proposal if appropriate
2. Exceedance for two or more consecutive samples	<ol style="list-style-type: none"> 1. Notify IEC, ER, Contractor and EPD; 2. Identify source; 3. Repeat measurement to confirm findings; 4. Increase monitoring frequency to daily; 5. Carry out analysis of Contractor's working procedures to determine possible mitigation to be implemented; 6. Arrange meeting with IEC and ER to discuss the remedial actions to be 	<ol style="list-style-type: none"> 1. Discuss amongst ER, ET, and Contractor on the potential remedial actions; 2. Review Contractor's remedial actions whenever necessary to assure their effectiveness and advise the ER accordingly; 3. Supervise the implementation of remedial measures. 	<ol style="list-style-type: none"> 1. Confirm receipt of notification of exceedance in writing; 2. Notify Contractor; 3. In consolidation with the IEC, agree with the Contractor on the remedial measures to be implemented; 4. Ensure remedial measures properly implemented; 5. If exceedance continues, 	<ol style="list-style-type: none"> 1. Take immediate action to avoid further exceedance; 2. Submit proposals for remedial actions to IEC within 3 working days of notification; 3. Implement the agreed proposals; 4. Resubmit proposals if problem still not under control; 5. Stop the relevant portion of works as determined by

EVENT	ACTION				CONTRACTOR
	ET	IEC	ER	CONTRACTOR	
	<p>taken;</p> <p>7. Assess effectiveness of Contractor's remedial actions and keep IEC, EPD and ER informed of the results;</p> <p>8. If exceedance stops, cease additional monitoring</p>			<p>consider what portion of the work is responsible and instruct the Contractor to stop that portion of work until the exceedance is abated.</p>	<p>the ER until the exceedance is abated</p>

Table E-2 Event / Action Plan For Construction Noise

EVENT	ACTION				CONTRACTOR
	ET	IEC	ER	CONTRACTOR	
Action Level being exceeded	<ol style="list-style-type: none"> 1. Notify IEC and Contractor; 2. Carry out investigation; 3. Report the results of investigation to the IEC, ER and Contractor; 4. Discuss with the Contractor and formulate remedial measures; 5. Increase monitoring frequency to check mitigation effectiveness 	<ol style="list-style-type: none"> 1. Review the analysed results submitted by the ET; 2. Review the proposed remedial measures by the Contractor and advise the ER accordingly; 3. Supervise the implementation of remedial measures. 	<ol style="list-style-type: none"> 1. Confirm receipt of notification of failure in writing; 2. Notify Contractor; 3. Require Contractor to propose remedial measures for the analysed noise problem; 4. Ensure remedial measures are properly implemented. 	<ol style="list-style-type: none"> 1. Submit noise mitigation proposals to IEC; 2. Implement noise mitigation proposals. 	
Limit Level being exceeded	<ol style="list-style-type: none"> 1. Identify source; 2. Inform IEC, ER, EPD and Contractor; 3. Repeat measurements to confirm findings; 4. Increase monitoring frequency; 5. Carry out analysis of Contractor's working procedures to determine possible mitigation to be implemented; 6. Inform IEC, ER and EPD the causes and actions taken for the exceedances; 7. Assess effectiveness of Contractor's remedial actions and keep IEC, EPD and ER informed of the results; 8. If exceedance stops, cease additional monitoring. 	<ol style="list-style-type: none"> 1. Discuss amongst ER, ET, and Contractor on the potential remedial actions; 2. Review Contractors remedial actions whenever necessary to assure their effectiveness and advise the ER accordingly; 3. Supervise the implementation of remedial measures. 	<ol style="list-style-type: none"> 1. Confirm receipt of notification of failure in writing; 2. Notify Contractor; 3. Require Contractor to propose remedial measures for the analysed noise problem; 4. Ensure remedial measures properly implemented; 5. If exceedance continues, consider what portion of the work is responsible and instruct the Contractor to stop that portion of work until the exceedance is abated. 	<ol style="list-style-type: none"> 1. Take immediate action to avoid further exceedance; 2. Submit proposals for remedial actions to IEC within 3 working days of notification; 3. Implement the agreed proposals; 4. Resubmit proposals if problem still not under control; 5. Stop the relevant portion of works as determined by the ER until the exceedance is abated. 	

**APPENDIX F
ENVIRONMENTAL MITIGATION
IMPLEMENTATION SCHEDULE (EMIS)**

APPENDIX F IMPLEMENTATION SCHEDULE OF ENVIRONMENTAL MITIGATION MEASURES (EMIS)

EM&A Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concern to Address	Who to implement the measures?	Location of the measure	When to implement the measures?	What requirements or standards for the measure to achieve
A	Air Quality					
S2.4.1.3	<p>Dust suppression measures stipulated in the Air Pollution Control (Construction Dust) Regulation and good site practices:</p> <ul style="list-style-type: none"> • Any excavated or stockpile of dusty material should be covered entirely by impervious sheeting or sprayed with water to maintain the entire surface wet and then removed or backfilled or reinstated where practicable within 24 hours of the excavation or unloading; • Any dusty material remaining after a stockpile is removed should be wetted with water and cleared from the surface of roads; • A stockpile of dusty material should not be extended beyond the pedestrian barriers, fencing or traffic cones; • The load of dusty materials on a vehicle leaving a construction site should be covered entirely by impervious sheeting to ensure that the dusty materials do not leak from the vehicle; • Where practicable, vehicle washing facilities with high pressure water jet should be provided at every discernible or designated vehicle exit point. The area where vehicle washing takes place and the road section between the washing facilities and the exit point should be paved with concrete, bituminous materials or hardcore; • The portion of any road leading only to construction site that is within 30m of a vehicle entrance or exit should be kept clear of dusty materials; • Surfaces where any pneumatic or power-driven drilling, cutting, polishing or other mechanical breaking operation takes place should be sprayed with water or a dust suppression chemical continuously; 	To minimize the dust impact	Contractor	Work Sites	Construction phase of Advance Works and Main Works of Phase 1A	Air Pollution Control Ordinance (APCO) and Air Pollution Control (Construction Dust) Regulation

	<ul style="list-style-type: none"> Any area that involves demolition activities should be sprayed with water or a dust suppression chemical immediately prior to, during and immediately after the activities so as to maintain the entire surface wet; Where a scaffolding is erected around the perimeter of a building under construction, effective dust screens, sheeting or netting should be provided to enclose the scaffolding from the ground floor level of the building, or a canopy should be provided from the first floor level up to the highest level of the scaffolding; Any skip hoist for material transport should be totally enclosed by impervious sheeting; Every stock of more than 20 bags of cement or dry pulverized fuel ash (PFA) should be covered entirely by impervious sheeting or placed in an area sheltered on the top and the 3 sides; Cement or dry PFA delivered in bulk should be stored in a closed silo fitted with an audible high level alarm which is interlocked with the material filling line and no overfilling is allowed; Loading, unloading, transfer, handling or storage of bulk cement or dry PFA should be carried out in a totally enclosed system or facility, and any vent or exhaust should be fitted with an effective fabric filter or equivalent air pollution control system. 					
B	Noise					
S3.4.1.1	<p>Use of movable barrier, enclosure, acoustic mat and quiet plant.</p> <p>Use of wooden frames barrier with a small-cantilevered upper portion of superficial density not less than 14kg/m² on a skid footing with 25mm thick internal sound absorptive lining.</p>	To minimize construction noise impact arising from the Project at the affected noise sensitive receivers (NSRs)	Contractor	Work Sites	Construction phase of Advance Works and Main Works of Phase 1A	EIAO-TM,
S3.4.1.2	<p>Good Site Practice:</p> <ul style="list-style-type: none"> Only well-maintained plant should be operated on-site and plant should be serviced regularly during the construction program. Silencers or mufflers on construction equipment should be utilized and should be properly maintained during the 	To minimize construction noise impact arising from the Project at the affected NSRs	Contractor	Work Sites	Construction period of Advance Works and Main Works of Phase 1A	EIAO-TM, NCO

	<p>construction program.</p> <ul style="list-style-type: none"> • Mobile plant, if any, should be sited as far away from NSRs as possible. • Machines and plant (such as trucks) that may be in intermittent use should be shut down between works periods or should be throttled down to a minimum. • Plant known to emit noise strongly in one direction should, wherever possible, be orientated so that the noise is directed away from the nearby NSRs. • Material stockpiles and other structures should be effectively utilized, wherever practicable, in screening noise from on-site construction activities. 							
C	Ecological Impact							
S4.2.1.2	Avoid unnecessary lighting.	Minimize mortality impacts on birds.	Design/ Contractor/ Plant Operator	Work Sites	Construction phase of Advance Works and Main Works of Phase 1A	EIAO-TM		
S4.2.1.3	Good construction site practice to minimise dust generation should be followed on all construction sites. Measures to avoid, minimise and mitigate impacts on air quality are detailed in this schedule	Minimize dust generation from construction sites.	Contractor	Work Sites	Construction phase of Advance Works and Main Works of Phase 1A	EIAO-TM		
S4.2.1.4	<p>The following measures to avoid, minimise and mitigate impact on water quality during construction phase shall be implemented</p> <ul style="list-style-type: none"> • Temporary sewerage and drainage to be designed and installed to collect wastewater and prevent it from entering water bodies; • Proper locations well away from nearby water bodies should be used for temporary storage of materials (i.e. equipment, filling materials, chemicals and fuel) and temporary stockpiles of construction debris and spoil, and these should be identified before commencement of works; • To prevent muddy water entering nearby water bodies, work sites close to nearby water bodies should be isolated, using such items as sandbags or silt curtains with lead edge at bottom and properly supported props. Other protective 	Avoid, minimise and mitigate impact on water quality	Contractor	Work Sites	Construction phase of Advance Works and Main Works of Phase 1A	EIAO-TM		

	<p>measures should also be taken to ensure that no pollution or siltation occurs to the water gathering grounds of the work sites;</p> <ul style="list-style-type: none"> • Construction debris and spoil should be covered and/or properly disposed of as soon as possible to avoid these being washed into nearby water bodies; • Proper locations for discharge outlets of temporary wastewater treatment facilities well away from sensitive receivers should be identified; • Adequate lateral support should be erected where necessary in order to prevent soil/mud from slipping into water bodies; • Site boundaries should be clearly marked and any works beyond the boundary strictly prohibited; • Regular water monitoring and site audit should be carried out at adequate points along any watercourses where construction works are underway upstream within their catchments and also on the Ng Tung, Sheung Yue and Shek Sheung Rivers. If the monitoring and audit results show that pollution occurs, adequate measures including temporarily cessation of works should be considered; • Excavation profiles should be properly designed and executed with attention to the relevant requirements for environment, health and safety; • Where soil to be excavated is situated beneath the groundwater table, it may be necessary to lower the groundwater table by installing well points or similar means; • Stockpiling sites should be lined with impermeable sheeting and banded. Stockpiles should be properly covered by impermeable sheeting to reduce dust emission during dry season or contaminated run-off during rainy season. Watering should be avoided on stockpiles of contaminated soil to minimize contaminated runoff and construction materials should be properly covered and located away from nearby water bodies; and • Supply of suitable clean backfill material after excavation, if required. • Vehicles containing any excavated materials should be suitably covered to limit potential dust emissions or contaminated run-off, and truck bodies and tailgates should be sealed to prevent discharge during transport or during wet 				
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	<ul style="list-style-type: none"> • Speed control for the trucks carrying contaminated materials should be enforced; • Vehicle wheel washing facilities at construction sites' exit points should be established and used, where necessary; and • Other measures as detailed in this schedule. 								
D	Water Quality Impact								
S5.2.2.1	Construction Site Runoff Practices and measures provided in the Practice Note for Professional Persons on Construction Site Drainage, (PROPECC PNI/94) should be followed where applicable.	Control construction runoff	Contractors	Work Sites	Construction phase of Advance Works and Main Works of Phase 1A	EIAO-TM, WPCO, EIAO			
S5.2.2.2–S5.2.2.3	<p>Sewage from Workforce</p> <ul style="list-style-type: none"> • Portable chemical toilets and sewage holding tanks should be provided for handling the construction sewage generated by the workforce. A licensed Contractor should be employed to provide appropriate and adequate portable toilets and be responsible for appropriate disposal and maintenance. • Notices should be posted at conspicuous locations to remind the workers not to discharge any sewage or wastewater into the nearby environment during the construction phase of the Project. Regular environmental audit on construction site should be conducted in order to provide an effective control of any malpractices and achieve continual improvement of environmental performance on site. It is anticipated that sewage generation during the construction phase of the Project would not cause water quality impact after undertaking all required measures 	Handling of site sewage	Contractors	Work Sites	Construction phase of Advance Works and Main Works of Phase 1A	EIAO-TM, WPCO, EIAO			
E	Waste Management								
S6.2.2.1	<p>Good Site Practices and Waste Reduction Measures:</p> <ul style="list-style-type: none"> • Nomination of an approved person, such as a site manager, to be responsible for the implementation of good site practices, arrangements for collection and effective disposal to an appropriate facility, of all wastes generated at the site; • Training of site personnel in site cleanliness, appropriate waste management procedures and concepts of waste reduction, reuse and recycling; • Provision of sufficient waste disposal points and regular 	Minimize waste Generation during construction	Contractor	Work Sites	Construction phase of Advance Works and Main Works of Phase 1A	Waste Disposal Waste Ordinance (WDO)			

<p>collection for disposal;</p> <ul style="list-style-type: none"> • Appropriate measures to minimise windblown litter and dust during transportation of waste by either covering trucks or by transporting wastes in enclosed containers; • Regular cleaning and maintenance programme for drainage systems, sumps and oil interceptors; • An Environmental Management Plan (EMP) should be prepared by the contractor and submitted to the Engineer for approval. 	<p>Reduce waste generation</p> <p>Contractor</p> <p>Work Sites</p> <p>Prior to the commencement of construction of Advance Works and Main Works of Phase 1A</p> <p>WDO</p>	
<p>Waste Reduction Measures:</p> <ul style="list-style-type: none"> • Segregate and store different types of waste in different containers, skip or stockpiles to enhance reuse or recycling of materials and their proper disposal; • Proper storage and site practices to minimize the potential for damage and contamination of construction materials; • Plan and stock construction materials carefully to minimize amount of waste generated and avoid unnecessary generation of waste; • Sort out demolition debris and excavated materials from demolition works to recover reusable/recyclable portions (i.e. soil, broken concrete, metal etc.); and • Provide training to workers on the importance of appropriate waste management procedures, including waste reduction, reuse and recycling. 	<p>Minimize waste impacts arising from waste storage</p> <p>Contractor</p> <p>Work Sites</p> <p>Construction phase of Advance Works and Main Works of Phase 1A</p> <p>WDO</p>	
<p>S6.2.4.1 -</p> <p>S6.2.4.2</p>	<p>Storage, Collection and Transportation of Waste Should any temporary storage or stockpiling of waste is required, recommendations to minimize the impacts include:</p> <ul style="list-style-type: none"> • Waste, such as soil, should be handled and stored well to ensure secure containment, thus minimizing the potential of pollution; • Stockpiling area should be provided with covers and water spraying system to prevent materials from wind-blown or being washed away; and • Different locations should be designated to stockpile each material to enhance reuse. • Remove waste in timely manner; • Employ the trucks with cover or enclosed containers for waste transportation; • Obtain relevant waste disposal permits from the appropriate authorities; and • Disposal of waste should be done at licensed waste disposal 	

	facilities.	<p>C&D Material from Buildings Demolition and New Building Construction</p> <ul style="list-style-type: none"> The Contractor should recycle as much as possible of the C&DM on-site. Public fill and C&DM waste should be segregated and stored in different containers or skips to enhance reuse or recycling of materials and their proper disposal. For example, concrete and masonry can be crushed and used as fill, and steel reinforcing bar can be used by scrap steel mills. Different areas of the work sites should be designated for such segregation and storage. The use of wooden hoardings shall not be allowed. An alternative material, such as metal, aluminium or alloy etc, could be used. Government has developed a charging policy for the disposal of waste to landfill at present. It will provide additional incentive to reduce the volume of generated waste and ensure proper segregation to allow reuse of the inert material on site when implemented. In order to minimize the impacts of the demolition works, the generated wastes must be cleared as quickly as possible after demolition. Therefore, the demolition and clearance works should be undertaken simultaneously. To facilitate proper segregation of inert and non-inert C&D material arising from demolition works, selective demolition method should be adopted. 	Minimize waste impacts from building demolition and new building construction	Contractor	Work Sites	Construction phase of Advance Works and Main Works of Phase 1A	Land (Miscellaneous Provisions) Ordinance, WDO, ETWB TCW No. 19/2005
S6.2.5.3		<p>Chemical Waste</p> <ul style="list-style-type: none"> If chemical wastes are produced at the construction site, the Contractors should register with EPD as chemical waste producers. Chemical wastes should be stored in appropriate containers and collected by a licensed chemical waste contractor. Chemical wastes (e.g. spent lubricant oil) should be recycled at an appropriate facility as far as possible, while the chemical waste that cannot be recycled should be disposed of at either the Chemical Waste Treatment Centre, or another licensed facility, in accordance with the Waste Disposal (Chemical Waste) (General) Regulation <p>General Refuse</p> <ul style="list-style-type: none"> General refuse should be stored in enclosed bins separately from construction and chemical wastes. 	Control the chemical waste and ensure proper storage, handling and disposal	Contractor	Work Sites	Construction phase of Advance Works and Main Works of Phase 1A	Waste Disposal (Chemical Waste General) Regulation, Code of Practice on the Packaging, Labelling and Storage of Chemical Waste
S6.2.5.4			Minimize production of the general refuse and avoid odour, pest	Contractor	Work Sites	Construction phase of Advance Works	Waste Disposal (Chemical Waste General) Regulation,
S6.2.5.5							

	<ul style="list-style-type: none"> • Recycling bins should also be placed to encourage recycling. • Preferably enclosed and covered areas should be provided for general refuse collection and routine cleaning for these areas should also be implemented to keep areas clean. • A reputable waste collector should be employed to remove general refuse on a daily basis. 	and litter impacts			and Main Works of Phase 1A	Code of Practice on the Packaging, Labelling and Storage of Chemical Waste
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**APPENDIX G
COMPLAINT LOG**

APPENDIX G – COMPLAINT LOG

Reporting Month: July 2018

Log Ref.	Location	Received Date	Details of Complaint	Investigation/Mitigation Action	Status
N.A.	N.A.	N.A.	N.A.	N.A.	N.A.

Remarks: No environmental complaint was received in the reporting month.

APPENDIX H
CONSTRUCTION PROGRAMME

Activity ID	Activity Name	Remaining Duration	Start	Finish	Total Float
AS20020	Completion of SWHSTW - Further Expansion Phase 1A - Advance Works E&M Works including T&C, process commissioning	380	30-Dec-15 A	23-Apr-19	0
Section I					
AS20010	Contract Completion of the works - Section I	0	30-Dec-15 A	23-Sep-16 A	
AS20020	Completion date - Section I (272 days from starting date)	0	30-Dec-15 A	23-Sep-16 A	
Time Risk Allowance and Planned Completion					
AS20040	Planned Completion date - Section I	0	30-Dec-15 A	23-Sep-16 A	
Section II					
AS30010	Contract Completion of the works - Section II	0	30-Dec-15 A	19-Mar-16 A	
AS30020	Completion date - Section II (60 days from starting date)	0	30-Dec-15 A	19-Mar-16 A	
Time Risk Allowance and Planned Completion					
AS30040	Planned Completion date - Section II	0	30-Dec-15 A	19-Mar-16 A	
Section III					
AS40010	Contract Completion of the works - Section III	440	30-Dec-15 A	15-Mar-19	38
AS40020	Completion date - Section III (1102 days from starting date)	0	30-Dec-15 A	23-Apr-19	0
Time Risk Allowance and Planned Completion					
AS40030	Time Risk Allowance for Completion of Function Test of Section III (4% of Installation duration, 163-169 days)	18	06-Apr-19	23-Apr-19	0
AS40040	Planned Completion date - Section III	0	30-Dec-15 A	23-Apr-19	0
Section IV					
AS50010	Contract Completion of the works - Section IV	0	30-Dec-15 A	28-Jul-17 A	
AS50020	Completion date - Section IV (278 days from starting date)	0	30-Dec-15 A	28-Jul-17 A	
Time Risk Allowance and Planned Completion					
AS50030	Time Risk Allowance for Section IV (4% of Installation duration, 120 days)	0	28-Jul-17 A	28-Jul-17 A	
AS50040	Planned Completion Date	0	30-Dec-15 A	28-Jul-17 A	
Activity Schedule No.1 - Preliminaries					
1.01 - Preliminaries					
Contractor's Site Office Construction					
AS10101	Construction of Contractors Site Office & Store	0	22-Jul-16 A	23-Sep-16 A	
AS10102	Maintain Contractors Site Office & Store	450	27-Oct-16 A	25-Mar-19	8
AS10104	Removal of Site Office, Store & Relevant Facilities	21	26-Mar-19	15-Apr-19	8
Site Facilities					
AS10103	Set up Temp. Electricity Supply, Water Supply	0	18-Apr-16 A	23-Sep-16 A	
AS10102	Provision of Temp. Electricity & Water Supply for erection for the Contract	471	27-Oct-16 A	15-Apr-19	8
Permanent Utilities Services					
AS10104	Applications to the Public Utilities for Provision of Services	0	28-Jun-16 A	23-Sep-16 A	
AS10101	Completion of CLP 11W Switchroom No.1 & No.2 (By Other Contractor)	0	30-Sep-17 A	20-Sep-17 A	
AS10102	BS Works for CLP 11 W Switchroom No.1 & No. 2	0	30-Sep-17 A	02-Nov-17 A	
AS10102g	H/O Inspection of 11 W Switchroom with CLP	10	03-Nov-17 A	12-Jun-18	75
AS10104	Handover of 11 W Switchroom to CLP	0	12-Jun-18	12-Jun-18	75
AS10104	Provision of Permanent Electricity Supply (by CLP)	120	13-Jun-18	12-May-19	75
AS10104s	CLP Meters Installed	0	22-May-18	22-May-18	84
AS10104e	Provision of Telephony & Telephone Lines	30	19-Aug-18	17-Sep-18	35
Provide all necessary labour, tools, materials, equipment and supervision					
AS10105	Environmental/Auditing and filling the Environmental Permit	471	28-Jun-16 A	15-Apr-19	9
O&M Manuals and As-Built Drawings					
AS10105f	Prepare & Submit the first draft O&M Manuals	80	19-May-18	15-Aug-18	87
AS10105g	Acceptance the first draft O&M Manuals	20	17-Aug-18	13-Sep-18	87
AS10107	Prepare & Submit the final draft O&M Manuals & all Drawings	90	23-Nov-18	20-Feb-19	17

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Provision of E&M Facilities for Shek Wu Hui Sewage Treatment Works

Further Expansion Phase 1A - Advance Works and

Ng Chow South Road Sewage Pumping Station

Master Programme

Legend:

- █ Remaining Work
- █ Critical Activity
- █ Milestone
- ◆ Actual Progress

Date	Revision	Checked	Approved
08-Jan-16	Rev. 0	KH Lau	KM
22-Jun-17	Rev. D	KH Lau	KM
12-Jul-17	Rev. E	KH Lau	KM
17-Oct-17	Rev. F	KH Lau	KM
27-Mar-18	Rev. G	KH Lau	KM

Activity ID	Activity Name	Remaining Work Duration	2019												Total Float		
			Jan-19	Feb-19	Mar-19	Apr-19	May-19	Jun-19	Jul-19	Aug-19	Sep-19	Oct-19	Nov-19	Dec-19			
AS10172	Acceptance the final draft O&M Manuals & all Drawings	28	21-Feb-19														34
AS10180	Training to Employer's Staff on the O&M of the Plant	45	21-Feb-19														17
AS10180	Provide training for the Employer's Staff																
AS10190	Provide EAM equipment & Office Stationery for the use of Project Manager and Supervisors	471	28-Mar-16A														8
AS10190	Provide clerical support to the Project Managers site office	471	28-Apr-16A														8
AS10190	Provide all necessary photographs, video clips and accessories	471	07-Jun-16A														8
AS10110	Contract Vehicle	0	30-Dec-15A														28-Jun-16A
AS10110	Provision of one contract vehicle (Electric Vehicle) during the normal working hours	0	30-Dec-15A														28-Jun-16A
AS10120	Provide Contract Vehicle Services, one (Petrol-Electricity) & one (Electric) during the normal working hours	0	30-Dec-15A														28-Jun-16A
AS10130	Provide O&M of the Contract Cars; Driving Services; Mobile Phone Services (normal working hours)	471	28-Jan-16A														15-Apr-19
AS10140	Provide O&M of the Electric Contract Cars; Driving Services (outside normal working hours)	471	28-Jan-16A														15-Apr-19
AS10150	Provide O&M of the Petrol-Electricity Contract Cars; Driving Services (outside normal working hours)	471	28-Jan-16A														15-Apr-19
AS10170	Uniform for Site Personnel and self-employed workers	471	28-Jun-16A														15-Apr-19
AS10180	Independent Checking Engineer	471	28-Jun-16A														15-Apr-19
AS10180	Provision of Independent Certified Engineer in accordance with the Specification	471	28-Jun-16A														15-Apr-19
AS10180	Automated External Defibrillator (AED)	0	15-Nov-16A														12-Dec-16A
AS10180	Provide Automated External Defibrillator (AED) and associated accessories	0	15-Nov-16A														12-Dec-16A
AS10192	Provide Training for Qualified on-site personnel for the use of AED	0	13-Dec-16A														28-Dec-16A
AS10200	Complete site management plan for trip ticket system	0	30-Dec-15A														13-Mar-16A
AS10200	Implementation of site management plan for trip ticket system	471	14-Mar-16A														15-Apr-19
AS10200	Implementation of site management plan for trip ticket system	471	14-Mar-16A														15-Apr-19
AS10200	Implementation of site management plan for trip ticket system	471	14-Mar-16A														15-Apr-19
AS10300	Site Cleaning and Tidiness	471	28-Sep-17A														19-Apr-19
AS10300	(i) Site and works area in Shek Wu Hui Sewage Treatment Works - Daily	0	05-Jun-16A														27-Sep-16A
AS10300	(ii) Site and works area in Ng Chow Nam Road Sewage Pumping Station - Daily	0	05-Jun-16A														27-Sep-16A
AS10300	(i) Site and works area in Ng Chow Nam Road Sewage Pumping Station - Weekly	471	28-Sep-17A														19-Apr-19
AS10300	(ii) Site and works area in Shek Wu Hui Sewage Treatment Works - Weekly	471	28-Sep-17A														19-Apr-19
AS10300	(i) Site and works area in Ng Chow Nam Road Sewage Pumping Station - Weekly	0	05-Jun-16A														27-Sep-16A
AS10300	(ii) Site and works area in Shek Wu Hui Sewage Treatment Works - Weekly	0	05-Jun-16A														27-Sep-16A
AS10400	Subcontractor Management Plan	0	30-Dec-15A														27-Feb-16A
AS10400	Complete sub-contractor management plan	471	28-May-16A														15-Apr-19
AS10400	Quarterly updating of sub-contractor management plan	471	28-May-16A														15-Apr-19
AS10500	Waste Management Plan	0	30-Dec-15A														28-Mar-16A
AS10500	Complete waste management plan	471	28-Mar-16A														15-Apr-19
AS10500	Review and updating of waste management plan	471	28-Mar-16A														15-Apr-19
AS10600	Safety Scheme	0	30-Dec-15A														27-Feb-16A
AS10600	Complete Safety Plan	471	28-Feb-16A														19-Apr-19
AS10600	Update Safety Plan	471	28-Feb-16A														15-Apr-19
AS10650	Provide Safety Officer	471	28-Apr-16A														15-Apr-19
AS10670	Attend Site Safety and Environment Management Committee	471	28-Apr-16A														15-Apr-19
AS10680	Attend Site Safety and Environment Committee	471	28-Apr-16A														15-Apr-19
AS10690	Arrange and attend weekly safety walk	471	28-Apr-16A														15-Apr-19
AS10800	Arrange and attend weekly environmental walk	471	28-Apr-16A														15-Apr-19
AS10810	Provide safety and environment training - (i) 1 day course (for first attendance)	471	28-Apr-16A														15-Apr-19
AS10820	Provide safety and environment training - (ii) 0.5 day (evaluation course)	471	28-Apr-16A														15-Apr-19
AS10830	Provide safety and environment training - site specific induction training	471	28-Apr-16A														15-Apr-19

Contract No. DE/2014/01

Provision of E&M Facilities for Shek Wu Hui Sewage Treatment Works

Further Expansion Phase 1A - Advance Works and

Ng Chow South Road Sewage Pumping Station

Master Programme

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Remaining Work

Critical Activity

Milestone

Actual Progress

Date	Revision	Checked	Approved
08-Jan-16	Rev. 0	KH Lau	KM
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17-Oct-17	Rev. F	KH Lau	KM
27-Mar-18	Rev. G	KH Lau	KM

Activity ID	Activity Name	Remaining Duration	Start	Finish	Notes
AS400160	Procurement of Other Associated Equip for MBR Pre-treatment Screen Facilities	23	20-Nov-17	22-Jun-18	
Tender and Award of Suppliers - Mechanical - BR1					
AS400200	Procurement of Aeration Blowers	0	27-Jun-16	24-Aug-16	
AS400210	Procurement of Submersible Mixers	0	29-May-16	22-Sep-16	
AS400220	Procurement of Mixed Liquor Return pumps	0	29-May-16	22-Sep-16	
AS400230	Procurement of Surplus Activated Sludge Pumps	0	29-May-16	22-Sep-16	
AS400240	Procurement of Air Diffusion System	0	29-Mar-16	01-Jun-16	
AS400250	Procurement of Associated pipework, ductwork & valves BR1	21	30-Sep-16	22-Jun-18	22-Jun-18, Procurement of associated pipework, ductwork & valves BR1
AS400260	Procurement of Foam control system and wash water spraying system	0	27-Jun-16	22-Sep-16	
AS400270	Procurement of other associated equipment for BR1	21	30-Sep-16	22-Jun-18	22-Jun-18, Procurement of other associated equipment for BR1
Tender and Award of Suppliers - Mechanical - MFS1					
AS400300	Procurement of Membrane Modules - MFS1	0	14-Mar-16	29-Apr-16	
AS400310	Procurement of Permeate Pumps - MFS1	0	12-Jun-16	23-Sep-16	
AS400320	Procurement of RAS/Backwash Pumps - MFS1	0	12-Jun-16	23-Sep-16	
AS400330	Procurement of Air Scouring Blowers - MFS1	0	13-May-16	24-Aug-16	
AS400340	Procurement of Air Compressor - MFS1	0	14-Mar-16	21-Dec-17	
AS400350	Procurement of Chemical Dosing System	0	30-Sep-16	29-Jun-17	
AS400360	Procurement of Permeate Drain Pumps, Drain Pumps for MFS1 & Cleaning drain Pump	0	30-Sep-16	05-Sep-17	
AS400370	Procurement of Wash Water Pumping System	0	09-Jul-17	05-Sep-17	
AS400380	Procurement of Associated Pipes, Valves & Fittings- MFS1	20	08-Jun-17	22-Jun-18	22-Jun-18, Procurement of associated Pipes, Valves & Fittings- MFS1
AS400390	Procurement of Other Associated Equipment - MFS1	20	08-Jun-17	22-Jun-18	22-Jun-18, Procurement of Other Associated Equipment - MFS1
Tender and Award of Suppliers - Mechanical - Flowmeter Chamber					
AS400400	Procurement of Flowmeters	0	29-May-16	22-Sep-16	
AS400410	Procurement of Flange Adapters & Other Associated Equipment	0	27-Oct-16	20-Sep-17	
Tender and Award of Suppliers - Pencoocks, Lifting Appliances & Deodorisation System					
AS400500	Procurement of Stopcocks	0	30-Sep-16	15-Feb-17	
AS400510	Procurement of Penstocks	0	30-Sep-16	15-Feb-17	
AS400520	Procurement of Deodorisers System	0	24-Feb-17	26-Jul-17	
Tender and Award of Suppliers - Electrical Main & Sub-main					
AS400600	Procurement of 11kV HV Switchboard	0	25-Apr-16	21-Sep-16	
AS400610	Procurement of 3.3kV HV Switchboard	0	25-Apr-16	21-Sep-16	
AS400620	Procurement of Transformer	0	25-Apr-16	21-Sep-16	
AS400630	Procurement of L.V. Switchboard	0	25-Apr-16	22-Sep-16	
AS400640	Procurement of Variable Speed Drive	0	30-Sep-16	07-Mar-17	
AS400650	Procurement of Starter for Motor, Screen & Mixer etc.	0	22-Aug-16	22-Sep-16	
AS400660	Procurement of Power Supply Cables	0	30-Sep-16	07-Dec-17	
AS400670	Procurement of Earthing & Lightning Materials	11	26-Nov-16	10-Jun-18	10-Jun-18, Procurement of Earthing & Lightning Materials
AS400680	Procurement of Cable Tray & Trunking etc.	0	26-Nov-16	24-Nov-17	
Tender and Award of Suppliers - Monitoring and Control System					
AS400700	Procurement of Monitoring & Control System	0	26-Nov-16	16-Jul-17	
Tender and Award of Suppliers - Building Services					
AS400720	Procurement of B.S. Pans & Materials	90	26-Nov-16	30-Mar-18	30-Mar-18, Procurement of B.S. Pans & Materials
AS400740	Procurement of F.S. Pans & Materials	80	26-Nov-16	28-Feb-18	28-Feb-18, Procurement of F.S. Pans & Materials

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Provision of E&M Facilities for Shek Wu Hui Sewage Treatment Works

Further Expansion Phase 1A - Advance Works and

Ng Chow South Road Sewage Pumping Station

Master Programme

Date	Revision	Checked	Approved
08-Jan-16	Rev. 0	KH Lau	KM
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27-Mar-18	Rev. G	KH Lau	KM

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Remaining Work

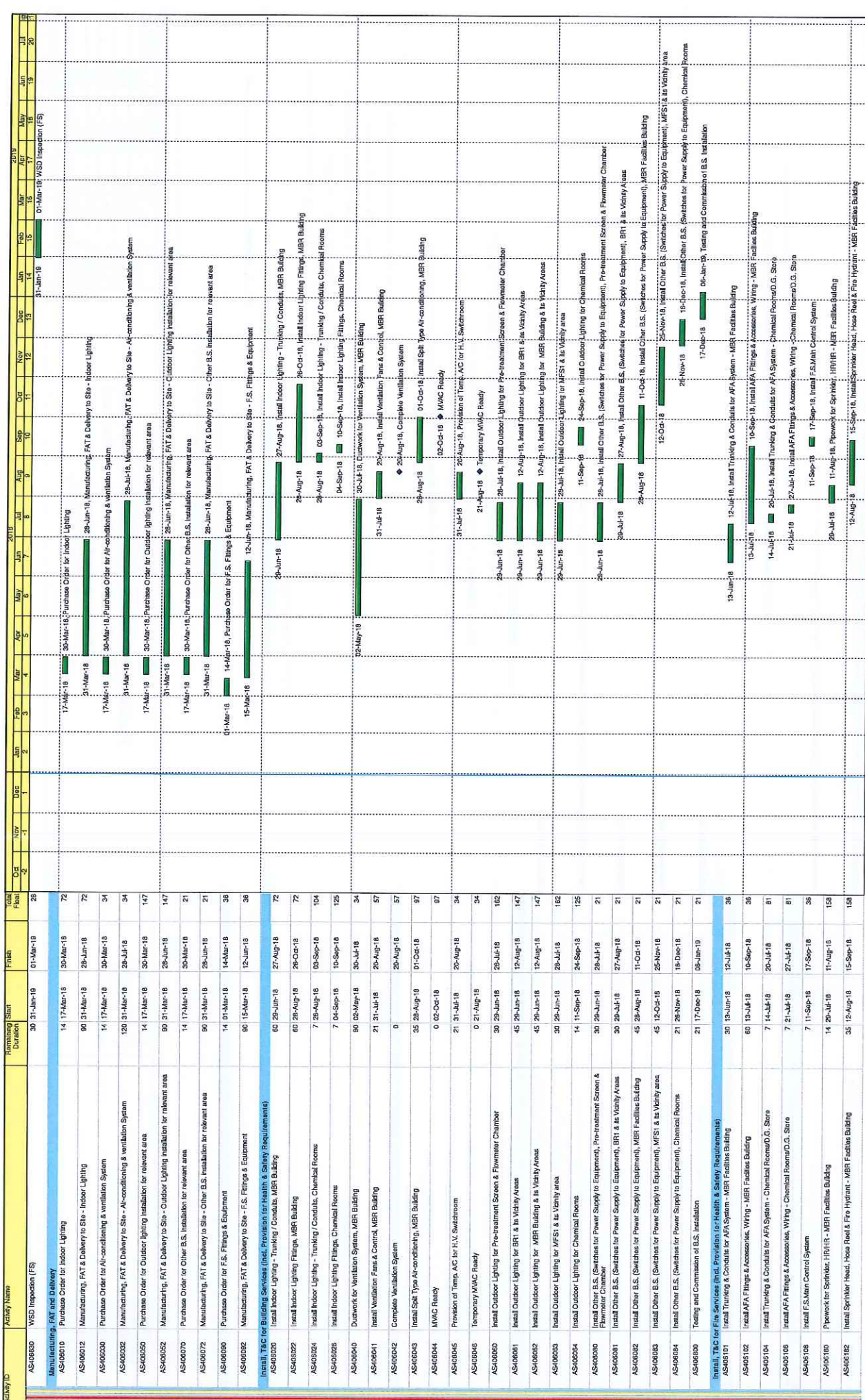
Critical Activity

Milestone

Actual Progress



Activity ID	Activity Name	Activity Duration	Remaining Start	Finish	2018	2019	2020	2018	2019	2020
AS403012	Manufacturing, FAT & Delivery to Site - Membrane Modules	66	151	28-Mar-18	30-Mar-18					
AS403020	Purchase Order for Permeate Pumps	0	13-Sep-18	23-Sep-18						
AS403022	Manufacturing, FAT & Delivery to Site - Permeate Pumps	9	07-Oct-18	28-Mar-18						
AS403050	Purchase Order for Return Activated Sludge Pumps	0	13-Sep-18	23-Sep-18						
AS403052	Manufacturing, FAT & Delivery to Site - Return Activated Sludge Pumps	0	07-Oct-18	06-Sep-17						
AS403070	Purchase Order for Backwash Pumps (Item Deleted)	0	31-Aug-18	31-Aug-18						
AS403072	Manufacturing, FAT & Delivery to Site - Backwash Pumps (Item Deleted)	0	31-Aug-18	31-Aug-18						
AS403090	Purchase Order for Air Scouring Blowers	0	15-Aug-18	24-Aug-18						
AS403092	Manufacturing, FAT & Delivery to Site - Air Scouring Blowers	30	11-Apr-18	28-Jun-18						
AS403110	Purchase Order for Air Compressor	0	18-Dec-17	21-Dec-17						
AS403112	Manufacturing, FAT & Delivery to Site - Air Compressor	120	25-Dec-17	29-Apr-18						
AS403130	Purchase Order for Chemical Dosing System (I) NACO Dosing Pump	0	05-Jun-17	29-Jun-17						
AS403132	Manufacturing, FAT & Delivery to Site - Chemical Dosing System (I) NACO Dosing Pump	121	30-Jun-17	30-Apr-18						
AS403150	Purchase Order for Chemical Dosing System (I) Chlorine Acid dosing pumps	0	05-Jun-17	29-Jun-17						
AS403152	Manufacturing, FAT & Delivery to Site - Chemical Dosing System (I) Chlorine Acid dosing pumps	121	30-Jun-17	30-Apr-18						
AS403170	Purchase Order for Chemical Dosing System (II) Chemical storage tank	0	06-Feb-17	28-Feb-17						
AS403172	Manufacturing, FAT & Delivery to Site - Chemical Dosing System (II) Chemical storage tank	121	01-Mar-17	30-Apr-18						
AS403190	Purchase Order for Permeate Drain Pumps, Drain Pumps for MFSI and Cleaning Drain Pumps	0	28-Aug-17	05-Sep-17						
AS403192	Manufacturing, FAT & Delivery to Site - Permeate Drain Pumps, Drain Pumps for MFSI and Cleaning Drain Pumps	123	05-Sep-17	02-May-18						
AS403210	Purchase Order for Wash water pumping system	0	28-Aug-17	05-Sep-17						
AS403212	Manufacturing, FAT & Delivery to Site - Wash water pumping system	121	06-Sep-17	03-Apr-18						
AS403220	Purchase Order for Associated ductworks, pipeworks and valves	11	12-Jun-18	02-Feb-18						
AS403222	Manufacturing, FAT & Delivery to Site - Associated ductworks, pipeworks and valves	90	03-Feb-18	03-May-18						
AS403250	Purchase Order for Other associated equipment for MFSI	11	23-Jan-18	02-Feb-18						
AS403252	Manufacturing, FAT & Delivery to Site - Other associated equipment for MFSI	80	03-Feb-18	03-Apr-18						
Install, T&E for MFSI (incl. Provision for Health & Safety Requirements)		0	07-Dec-17	20-Dec-17						
AS403002	Mobilisation of Works - MBR Facilities Building GF	7	31-Mar-18	08-Apr-18						
AS403004	Mobilisation of Works - MFSI	7	03-Apr-18	06-Apr-18						
AS403020	Install Membrane Modules, MFS Tank	60	26-Jul-18	26-Sep-18						
AS403040	Install Permeate Pumps, No.1 - No.6, MBR Blg	45	07-Apr-18	21-May-18						
AS403060	Install Return Activated Sludge Pumps, No.1 - No.5, MBR Blg	30	28-Jun-18	25-Jul-18						
AS403080	Install Backwash Pumps - MBR Blg (Not required)	0	30-Dec-17	30-Dec-17						
AS403100	Install Air Scouring Blowers, MBR Blg	45	28-Apr-18	11-Jun-18						
AS403120	Install Air Compressor, MBR Blg.	30	12-Jun-18	11-Jul-18						
AS403140	Mobilisation of Works - Chemical Rooms	14	01-May-18	14-May-18						
AS403142	Install NACO Dosing Pumps & Storage Tank	30	15-Jun-18	15-Jun-18						
AS403160	Install Chlorine Acid Dosing Pumps & Storage Tank	30	14-Jun-18	15-Jul-18						
AS403180	Install Acetic Acid Dosing Pumps & Storage Tank	30	14-Jul-18	15-Aug-18						
AS403200	Install Permeate Drain Pumps, Drain Pumps for MFSI and Cleaning Drain Pumps, MFSI Drain Chamber	30	23-May-18	20-Jun-18						
AS403220	Install Wash water pumping system, MBR Blg.	21	21-Jun-18	11-Jul-18						
AS403240	Install Associated ductworks, pipeworks and valves	120	28-Apr-18	25-Aug-18						



Activity ID	Activity Name	Remaining Start Duration	Finish	Total Float
AS400830	WSD Inspection (FS)	30	31-Jan-18	28
AS400810	Manufacturing, FAT and Delivery Purchase Order for Indoor Lighting	14	17-Mar-18	72
AS400012	Manufacturing, FAT & Delivery to Site - Indoor Lighting	90	31-Mar-18	72
AS400030	Purchase Order for Air-conditioning & ventilation System	14	17-Mar-18	34
AS400032	Manufacturing, FAT & Delivery to Site - Air-conditioning & ventilation System	120	31-Mar-18	34
AS400050	Purchase Order for Outdoor lighting installation for relevant area	14	17-Mar-18	147
AS400052	Manufacturing, FAT & Delivery to Site - Outdoor Lighting Installation for relevant area	90	31-Mar-18	147
AS400070	Purchase Order for Other B.S. Installation for relevant area	14	17-Mar-18	21
AS400072	Manufacturing, FAT & Delivery to Site - Other B.S. Installation for relevant area	90	31-Mar-18	21
AS400090	Purchase Order for F.S. Filings & Equipment	14	01-Mar-18	38
AS400092	Manufacturing, FAT & Delivery to Site - F.S. Filings & Equipment	90	15-Mar-18	38
AS400200	Install Indoor Lighting - Trunking / Conduits, MBR Building	60	29-Jun-18	72
AS400202	Install Indoor Lighting - Trunking / Conduits, Chemical Rooms	60	29-Aug-18	72
AS400204	Install Indoor Lighting - Trunking / Conduits, Chemical Rooms	7	29-Aug-18	104
AS400206	Install Indoor Lighting - Trunking / Conduits, Chemical Rooms	7	04-Sep-18	125
AS400400	Dutwork for Ventilation System, MBR Building	90	02-May-18	34
AS400641	Install Ventilation Fans & Control, MBR Building	21	31-Jul-18	57
AS400642	Complete Ventilation System	0	20-Aug-18	57
AS400043	Install Split Type Air-conditioning, MBR Building	35	28-Aug-18	97
AS400044	MWAC Ready	0	02-Oct-18	97
AS400045	Provision of Temp. AC for H.V. Switchroom	21	31-Jul-18	34
AS400046	Temporary MWAC Ready	0	21-Aug-18	34
AS400350	Install Outdoor Lighting for Pre-treatment Screen & Flowmeter Chamber	30	29-Jun-18	162
AS400661	Install Outdoor Lighting for BRT & its Vicinity Areas	45	26-Jun-18	147
AS400662	Install Outdoor Lighting for MBR Building & its Vicinity Areas	45	26-Jun-18	147
AS400663	Install Outdoor Lighting for MFS1 & its Vicinity area	30	26-Jun-18	182
AS400664	Install Outdoor Lighting for Chemical Rooms	14	11-Sep-18	125
AS400060	Install Other B.S. (Switches for Power Supply to Equipment), Pre-treatment Screen & Flowmeter Chamber	30	26-Jun-18	21
AS400061	Install Other B.S. (Switches for Power Supply to Equipment), BRT & its Vicinity Areas	30	29-Jul-18	21
AS400062	Install Other B.S. (Switches for Power Supply to Equipment), MBR Facilities Building	45	28-Aug-18	21
AS400063	Install Other B.S. (Switches for Power Supply to Equipment), MFS1 & its Vicinity area	45	12-Oct-18	21
AS400064	Install Other B.S. (Switches for Power Supply to Equipment), Chemical Rooms	21	26-Nov-18	21
AS400800	Testing and Commission of B.S. Installation	21	17-Dec-18	21
AS400101	Install Trunking & Conduits for AFA System - MBR Facilities Building	30	13-Jun-18	35
AS400102	Install AFA Filings & Accessories, Wiring - MBR Facilities Building	60	13-Jul-18	35
AS400104	Install Trunking & Conduits for AFA System - Chemical Rooms/D.G. Store	7	14-Jul-18	61
AS400105	Install AFA Filings & Accessories, Wiring - Chemical Rooms/D.G. Store	7	21-Jul-18	61
AS400106	Install F.S. Main Control System	7	11-Sep-18	35
AS400109	Pipework for Sprinkler, IRR/HR - MBR Facilities Building	14	20-Jul-18	159
AS400112	Install Sprinkler Head, Hose Reel & Fire Hydrant - MBR Facilities Building	35	12-Aug-18	159

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Legend:
 Remaining Work (Green bar)
 Critical Activity (Red bar)
 Milestone (Blue diamond)
 Actual Progress (Blue bar)

Revision History:
 Date | Revision | Checked | Approved
 08-Jan-16 | Rev. 0 | KH Lau | KM
 22-Jun-17 | Rev. D | KH Lau | KM
 12-Jul-17 | Rev. E | KH Lau | KM
 17-Oct-17 | Rev. F | KH Lau | KM
 27-Mar-18 | Rev. G | KH Lau | KM



Activity ID	Activity Name	Remaining Start	Finish	Total	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	2018	2019						
		Duration		Final	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
AS407384	Install MCB Distribution Board, DB-P8 (Chemical Room 2)	14	08-Jul-18	19-Jul-18	1																			
AS407385	Functional Test - L.V. Switchboard No. 1	30	20-Jul-18	19-Aug-18	1																			
AS407386	L.V. Switchboard No. 1 Ready for Energisation	0	19-Aug-18																					
AS407387	Functional Test - L.V. Switchboard No. 2	30	30-Jun-18	29-Jul-18	21																			
AS407388	L.V. Switchboard No. 2 Ready for Energisation	0	19-Aug-18																					
AS407390	Install, T&C of PCB&S	60	26-Aug-18	24-Oct-18	26																			
AS407600	Earthing System for MFSI Completed	0	19-Aug-18																					
AS407620	Submit WRI to EMSD for Electrical System, MFSI	7	19-Aug-18	25-Aug-18	25																			
AS407640	Power On for MFSI System	0	25-Aug-18																					
AS407650	Install, T&C for BR1's Vicinity Area (Incl. Provision for Health & Safety Requirements)	14	01-May-18	14-May-18	37																			
AS407659	Mobilisation of Works - BR1's Vicinity Area	0	15-May-18																					
AS407670	Construction of Canopy for housing the L.V. Switchboard No.3	30	15-May-18	13-Jun-18	37																			
AS407680	Functional Test - L.V. Switchboard No. 3	30	14-Jun-18	13-Jul-18	37																			
AS407686	L.V. Switchboard No. 3 Ready for Energisation	0	14-Jun-18																					
AS407688	Install MCB Distribution Board, DB-P8 (Power supply from Switchboard No.3)	7	14-Jun-18	20-Jul-18	170																			
AS407700	Complete Earthing & Lighting System for BR1	0	19-Aug-18																					
AS407720	Submit WRI to EMSD for Electrical System, BR1	5	19-Aug-18	25-Aug-18	1																			
AS407740	Power On for BR1 System	0	24-Aug-18																					
4.8 Lifting Appliances																								
Manufacturing, FAT and Delivery																								
AS408010	Purchase Order for 1 no. 1,500 kgs Lifting Appliance - (I) For Pre-treatment Screen Chamber	0	08-Feb-17	14-Feb-17																				
AS408012	Manufacturing, FAT & Delivery to Site - 1 no. 1,500 kgs Lifting Appliance - (I) For Pre-treatment Screen Chamber	0	15-Feb-17	06-Dec-17																				
AS408020	Purchase Order for 1 no. 500 kgs Lifting Appliance - (II) For BR1	0	08-Feb-17	14-Feb-17																				
AS408022	Manufacturing, FAT & Delivery to Site - 1 no. 500 kgs Lifting Appliance - (II) For BR1	39	15-Feb-17	07-Feb-18	66																			
AS408050	Purchase Order for 1 no. 3,000 kgs & 1 no. 4,000 kgs Lifting Appliance - (III) In G/F of Membrane Facilities Building	0	08-Feb-17	14-Feb-17																				
AS408052	Manufacturing, FAT & Delivery to Site - 1 no. 3,000 kgs & 1 no. 4,000 kgs Lifting Appliance - (III) In G/F of Membrane Facilities Building	0	15-Feb-17	06-Dec-17																				
AS408070	Purchase Order for 2 nos. 8,500 kgs Lifting Appliance - (IV) In 1/F of Membrane Facilities Building	0	08-Feb-17	14-Feb-17																				
AS408072	Manufacturing, FAT & Delivery to Site - 2 nos. 8,500 kgs Lifting Appliance - (IV) In 1/F of Membrane Facilities Building	39	15-Feb-17	07-Feb-18	30																			
AS408080	Purchase Order for 2 nos. 5,000 kgs Lifting Appliance - (V) For MFSI	0	08-Feb-17	14-Feb-17																				
AS408092	Manufacturing, FAT & Delivery to Site - 2 nos. 5,000 kgs Lifting Appliance - (V) For MFSI	81	15-Feb-17	31-Mar-18	58																			
Install, T&C for Pre-treatment Screen Chamber (Incl. Provision for Health & Safety Requirements)																								
AS408020	Mobilisation of Works - MBR Pre-treatment Screen Chamber	14	04-Jun-18	17-Jun-18	37																			
AS408022	Install Membral Arch-type support column, 1,500kgs S.W.L., Electric Chain Hoist	45	08-Feb-18	24-Mar-18	16																			
AS408024	SAT of Lifting Appliance	14	25-Mar-18	07-Apr-18	16																			
Install, T&C for Bioreactor No.1 (BR1) (Incl. Provision for Health & Safety Requirements)																								
AS408040	Install Membral 500kgs S.W.L. Manual Hoist over Trolley	14	03-Apr-18	16-Apr-18	12																			
AS408042	SAT of Lifting Appliance	14	17-Apr-18	30-Apr-18	12																			
Install, T&C for MBR Facilities Building (Incl. Provision for Health & Safety Requirements)																								
AS408050	Install Electric Travelling Crane for 1 No. 3,000 kg S.W.L. & 1 No. 4,000 S.W.L. - G/F	65	07-Dec-17	05-Mar-18	7																			
AS408062	SAT of Lifting Appliance, G/F	25	08-Mar-18	30-Mar-18	7																			
AS408060	Install 2 Nos. Electric Travelling Crane for 8,500 kg S.W.L. - 1/F	35	24-Feb-18	30-Mar-18	14																			
AS408062	SAT of Lifting Appliance, 1/F	28	31-Mar-18	27-Apr-18	14																			
Install, T&C for MFSI (Incl. Provision for Health & Safety Requirements)																								
AS408101	Install 2 Nos. Electric Travelling Crane for 5,000 kg S.W.L. - MFSI Trains	30	01-Apr-18	30-Apr-18	58																			

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Remaining Work
 Critical Activity
 Milestone
 Actual Progress

Approved
 08-Jan-16
 Rev. D
 22-Jun-17
 Rev. D
 12-Jul-17
 Rev. E
 17-Oct-17
 Rev. F
 27-Mar-18
 Rev. G



Activity ID	Activity Name	Remaining Duration	Start	Finish	Total Float	2013	2014	2015	2016	2017	2018	2019	2020
						Jan	Feb	Mar	Apr	May	Jun	Jul	Aug
AS410010	Purchase Order for Deodorisers system with odourifier	0	10-Jul-17A	26-Jul-17A									
AS410012	Manufacturing, FAT & Delivery to Site - Deodorisers system with odourifier	138	27-Jul-17A	15-May-18	66								
AS410020	Purchase Order for S.S. Ducting & Accessories	0	24-Jul-17A	26-Jul-17A									
AS410032	Manufacturing & Delivery to Site - S.S. Ducting & Accessories	138	27-Jul-17A	15-May-18	66								
AS410020	Install Deodorising Plant	45	16-May-18	29-Jun-18	66								
AS410040	Install S.S. Ducting, Accessories & Deodorising Control System	35	15-Jun-18	19-Jul-18	66								
4.11 Maintenance Platform & Covers													
AS411010	Purchase Order for maintenance platforms, stairways, hand railings and covers	7	01-Apr-18	07-Apr-18	4								
AS411012	Manufacturing & Delivery to Site - maintenance platforms, stairways, hand railings and covers	90	08-Apr-18	05-Jun-18	4								
AS411030	Purchase Order for Maintenance Platform in Basement of MBR Facilities Building	7	01-Apr-18	07-Apr-18	19								
AS411032	Manufacturing & Delivery to Site - Maintenance Platform in Basement of MBR Facilities Building	45	08-Apr-18	22-May-18	19								
AS411050	Purchase Order for FRP covers for Membrane Facilities Tanks	0	02-May-17A	08-May-17A									
AS411052	Manufacturing & Delivery to Site - FRP covers for Membrane Facilities Tanks	91	03-May-17A	31-Mar-18	28								
AS411070	Purchase Order for Steel Covers for Air Blower Opening on 1F of MBR Bldg. (Not required)	0	30-Dec-17A	30-Dec-17A									
AS411072	Manufacturing & Delivery to Site - Steel Cover for Air Blower Opening on 1F of MBR Bldg. (Not required)	0	30-Dec-17A	30-Dec-17A									
Install, TEC for Maintenance Platform & Covers (incl. Provision for Health & Safety Requirements)													
AS411020	Install maintenance platforms, stairways, hand railings and covers	75	07-Jun-18	20-Aug-18	4								
AS411040	Install Hand Rail & Maintenance Platform in Basement of MBR Facilities Building	45	23-May-18	06-Jul-18	19								
AS411060	Install FRP covers for Membrane Facilities Tanks	90	10-Apr-18	08-Jun-18	17								
AS411080	Install Steel Cover for Air Blower Opening on 1F of MBR Bldg. (Not required)	0	30-Dec-17A	30-Dec-17A									
4.12 SCADA													
Manufacturing, FAT and Delivery													
AS412010	Purchase Order for Proposed SCADA	0	03-Jul-17A	18-Jul-17A	48								
AS412012	Manufacturing & Delivery to Site - Proposed SCADA	90	10-Jul-17A	30-Mar-18									
AS412020	Purchase Order for PLC System	0	10-Jul-17A	18-Jul-17A									
AS412022	Manufacturing & Delivery to Site - PLC System	90	19-Jul-17A	30-Mar-18	48								
AS412050	Purchase Order for Instrumentation in Flowmeter and MBR Pre-treatment Screen Chambers	91	31-Dec-17	31-Mar-18	23								
AS412052	Manufacturing & Delivery to Site - Instrumentation in Flowmeter and MBR Pre-treatment Screen Chambers	90	01-Apr-18	29-Jun-18	23								
AS412070	Purchase Order for Instrumentation in BR1	91	31-Dec-17	31-Mar-18	37								
AS412072	Manufacturing of Instrumentation in BR1	90	01-Apr-18	29-Jun-18	37								
AS412090	Purchase Order for Instrumentation in MFS1 & MFB	91	31-Dec-17	31-Mar-18	51								
AS412092	Manufacturing & Delivery to Site - Instrumentation in MFS1 & MFB	90	01-Apr-18	29-Jun-18	51								
AS412110	Purchase Order UPS for PLC Systems A	0	03-Jul-17A	18-Jul-17A									
AS412112	Manufacturing & Delivery to Site - UPS for PLC Systems A	90	10-Jul-17A	30-Mar-18	177								
AS412130	Purchase Order UPS for PLC Systems B	0	03-Jul-17A	18-Jul-17A									
AS412132	Manufacturing & Delivery to Site - UPS for PLC Systems B	90	19-Jul-17A	30-Mar-18	177								
Install, TEC for SCADA (incl. Provision for Health & Safety Requirements)													
AS412001	Modification of Works - Areas for laying works of optical fibres	7	03-Apr-18	09-Apr-18	8								
AS412020	Laying Fibre Optical Ethernet Ring	30	10-Apr-18	09-May-18	8								
AS412021	Set Up and Demonstrate all the Functionality of the Proposed SCADA/PLC System A	45	10-May-18	25-Jun-18	8								
AS412022	Modify Existing Master Station at Control Room	45	24-Jun-18	07-Aug-18	12								
AS412023	Install SCADA Master Station	35	08-Apr-18	11-Sep-18	12								
AS412024	Wiring for Control & Monitoring Circuits, Terminal - SCADA	30	12-Sep-18	11-Oct-18	12								

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Remainding Work
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Approved

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 Revision
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12-Jul-17	Rev. E	KH Lau	KM
17-Oct-17	Rev. F	KH Lau	KM
27-Mar-18	Rev. G	KH Lau	KM

Activity ID	Activity Name	Remaining Duration	2018												2019																		
			Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec						
ASH12025	Tuning - SCADA	30													18-Oct-18	16-Nov-18																	
ASH12040	Install Tuning & Tray - PLC System	21													24-Jun-18																		
ASH12042	Install Controller & Associated Component - PLC System	14													15-Jul-18																		
ASH12044	Wiring for Control & Monitoring Circuits, Termination - PLC System	21													29-Aug-18																		
ASH12046	Tuning - PLC System	30													19-Sep-18																		
ASH12060	Install Instrumentation in Flowmeter, MBR Pre-treatment Screen Chamber	14													17-Jul-18																		
ASH12060	Install Instrumentation in BRT	14													31-Jul-18																		
ASH12100	Install Instrumentation in MFS1	14													14-Aug-18																		
ASH12120	Install UPS for PLC system A	30													29-Aug-18																		
ASH12140	Install UPS for PLC system B	30													29-Aug-18																		
4.19 Supply & Delivery of Miscellaneous Equipment																																	
ASH13010	Supply and Delivery of Telephones set, kit, In and accessories	60													22-Jan-19																		
ASH13020	Supply and Delivery of Aluminum scaffolding	60													22-Jan-19																		
ASH13030	Supply and Delivery of Maintenance trolley for Air Circuit Breaker	60													22-Jan-19																		
ASH13040	Supply and Delivery of Portable Gas detector	60													22-Jan-19																		
ASH13050	Supply and Delivery of Portable ventilation fan	60													22-Jan-19																		
ASH13060	Supply and Delivery of Forklift truck and battery charger	60													22-Jan-19																		
ASH13070	Supply and Delivery of Access and working platforms	60													22-Jan-19																		
ASH13080	Supply and Delivery of Portable drainage pump	60													22-Jan-19																		
ASH13090	Supply and Delivery of Sump Pump	60													30-Jul-18																		
ASH13100	Installation of Sump Pump	21													31-Aug-18																		
4.19 Supply & Delivery of Spares & Tools																																	
ASH14010	Delivery of (a) Automatic expander spare parts & (b) Sight glasses for MFS	30													21-Feb-19																		
ASH14020	Delivery of Spares & Tools for LV Switchboard, Central Panels and SCADA System	30													21-Feb-19																		
ASH14030	Delivery of Spares & Tools for HV Switchboard (including capacitor correction units)	30													21-Feb-19																		
ASH14040	Delivery of Spares & Tools for SCADA System, PLC system and instrumentation	30													21-Feb-19																		
ASH14050	Delivery of Spares & Tools for Air Blower	30													21-Feb-19																		
ASH14060	Delivery of Spares & Tools for Ventilation Diffuser	30													21-Feb-19																		
ASH14070	Delivery of Spares & Tools for Centrifugal Pump	30													21-Feb-19																		
ASH14080	Delivery of Spares & Tools for Panacos, Actuator and Valve	30													21-Feb-19																		
ASH14090	Delivery of Spares & Tools for Lifting Appliances	30													21-Feb-19																		
ASH14100	Delivery of Spares & Tools for Special Tool and measuring equipment	30													21-Feb-19																		
ASH14110	Delivery of Spares & Tools for Desodorization Unit	30													21-Feb-19																		
ASH14120	Delivery of Spares & Tools for Wash Compactor	30													21-Feb-19																		
ASH14130	Delivery of Spares & Tools for MBR Pre-treatment Screens	30													21-Feb-19																		
ASH14140	Delivery of Spares & Tools for Submersible mixer	30													21-Feb-19																		
ASH14150	Delivery of Spares & Tools for MLR pump	30													21-Feb-19																		
ASH14160	Delivery of Spares & Tools for BR Feedpump	30													21-Feb-19																		
ASH14170	Lubricants for 1 year use of all equipment	30													21-Feb-19																		
Process Commissioning																																	
ASH12010	Commissioning Plan & Procedure	90													26-May-18																		
ASH12012	Comments on Process Commissioning Plan	28													24-Aug-18																		

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<p>Process Commissioning</p> <p>Commissioning Plan & Procedure Prepare / ICE Certified / Submit a Process Commissioning Plan</p>		<p>26-May-18</p> <p>24-Aug-18</p>		<p>24-Aug-18</p> <p>20-Sep-18</p>		<p>Date</p> <p>08-Jan-16 22-Jun-17 12-Jul-17 17-Oct-17 27-Mar-18</p>						<p>Revision</p> <p>Rev. 0 Rev. D Rev. E Rev. F Rev. G</p>						<p>Checked</p> <p>KH Lau KH Lau KH Lau KH Lau KH Lau</p>						<p>Approved</p> <p>KM KM KM KM KM</p>					

Activity ID	Activity Name	Remaining Start	Remaining Duration	2018												Total Fwd	Total
				Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec		
AS112014	ICE Certified / Re-submit Process Commissioning Plan	28/21-Sep-18	18-Oct-18														
AS112016	Acceptance of Process Commissioning Plan	14/19-Oct-18	01-Nov-18														
AS112020	Commissioning Process Period Commencing of Process Commissioning	0/23-Nov-18	0														
AS112022	Preparation for the Process Commissioning	30/23-Nov-18	22-Dec-18														
AS112024	Process Commissioning	30/23-Nov-18	22-Dec-18														
AS112030	Sample analysis of the testing conducted for process commissioning by an Independent Lab. (ICILAS)	20/26-Jun-19	05-Apr-19														
AS112040	Completion of Process Commissioning	0/05-Apr-19	0														
Section IV of Works																	
Valve with Electric Actuators																	
Manufacturing, FAT and Delivery																	
AS501100	Procurement of Valves with electric actuators	0/13-Feb-18A	28-Apr-18A														
AS501120	Manufacturing & Delivery / FAT of Valve with electric actuators	0/26-Mar-18A	09-Sep-18A														
Install, T&C for Valve with Electric Actuators (Incl. Provision for Health & Safety Requirements)																	
AS502100	Installation and Enabling Works for NCS/SPS	0/31-Aug-16A	09-Sep-16A														
AS502120	Install Valves with Electric Actuators	0/10-Sep-16A	29-Sep-16A														
Modification of Control System																	
Manufacturing, FAT and Delivery																	
AS503100	Procurement of Control System	0/19-Mar-18A	01-Jun-18A														
AS503120	Manufacturing, FAT & Delivery of Control System	0/02-Jun-18A	22-Sep-18A														
Install, T&C for Control System (Incl. Provision for Health & Safety Requirements)																	
AS504100	Modification of Existing Pump Control System	0/17-Mar-17A	11-May-17A														
Associated Pipework and Fittings																	
Manufacturing, FAT and Delivery																	
AS505100	Procurement of Associated Pipework and Fittings	0/28-Feb-16A	01-Jun-16A														
AS505120	Manufacturing, FAT & Delivery of Associated Pipework and Fittings	0/26-Mar-18A	09-Sep-18A														
Install, T&C for Associated Pipework & Fittings (Incl. Provision for Health & Safety Requirements)																	
AS506100	Install Associated Pipework and Fittings	0/19-Sep-16A	29-Sep-16A														
AS506200a	Availability of New Ring Main to Hung Lung SPS (By Others)		11-Apr-17A														
AS506200b	Pipe connection to New Ring Main to Hung Lung SPS	0/01-Mar-17A	27-Mar-17A														
Commissioning of the Pumping System																	
AS511100	Site Tests / Functional Test for level control and venting equipment	0/12-Apr-17A	11-May-17A														
AS511100a	Further coordination with DSD for Carrying Out Commissioning Test	0/12-Mar-17A	05-Jun-17A														
AS511120	Commissioning of the Pumping System	0/09-Jun-17A	09-Jun-17A														
AS513120a	Upload PLC Programme for Modified Pump Control System	0/28-Jul-17A	28-Jul-17A														



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