Drainage Services Department

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

Monthly EM&A Report

(June 2018)

Verified by : Mr. Adi Lee

Position : Independent Environmental Checker

Date : 17 Jul 2018

Drainage Services Department

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

Monthly EM&A Report

(June 2018)

Certified by	:	Mr. T. W. Tam
Position	:	Environmental Team Leader of Contract No. DC/2013/09
Date	:	16 July 2018

Drainage Services Department

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

Monthly EM&A Report

(June 2018)

Certified by	:	Dr. Priscilla Choy
Position	:	Environmental Team Leader of Contract No. DE/2014/01
Date	:	17 July 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 June 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	Portion A • Concreting the wall and roof slab of LV switch room • Excavation of DN80, DN100 and DN300 pumping pipe outside MFB • Installation of FRP hand-railing at membrane facilities building • Excavation of trench for installation of E&M cable duct • Footpath and roadwork reinstatement • Interior and exterior decoration of chemical room and LV switch room • Excavation and pipe laying and manhole construction for drainage works
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	• 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 in Bioreactor No.1 (BR1). • Mechanical Installation of Diffusers and associated equipment in Bioreactor No.1 (BR1). • Electrical Installation in 11kV HV Switchroom. • 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	36	0	0
	24-hour TSP	12	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: 7, 14, 21 and 28 June 2018
Contract No. DE/2014/01: 7, 14, 21 and 28 June 2018

1.4.2 IEC conducted site audit on 28 June 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	• External finishing of chemical storage room and LV switch room • Concreting of wall and roof slab of LV switch room • Removal of formwork of wall and roof slab of LV switch room • Construction of DN150 fire services main • Construction of plinth support and concrete gantry of DN1400 pipe at BR1 • Excavation of DN350 pipe near pretreatment chamber • Excavation of trench for installation of E&M cable duct • Installation of FRP railing at membrane tank • Installation of multi part cover of manhole E3A • Construction of underground drainage pipe and manhole • Footpath and road work construction	• Dust impact from excavation work, dusty material handling and during concrete production • Muddy runoff water generated from the dusty material stockpile during rainy days	• Implement dust suppression measures at all times • Implement construction site runoff control practices and measures at all times
DE/2014/01	• 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. • 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 of Diffusers and associated equipment within Bioreactor No.1 (BR1).	• 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	• 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 June 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	Portion A • Concreting the wall and roof slab of LV switch room • Excavation of DN80, DN100 and DN300 pumping pipe outside MFB • Installation of FRP hand-railing at membrane facilities building • Excavation of trench for installation of E&M cable duct • Footpath and roadwork reinstatement • Interior and exterior decoration of chemical room and LV switch room • Excavation and pipe laying and manhole construction for drainage works
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	• 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 in Bioreactor No.1 (BR1). • Mechanical Installation of Diffusers and associated equipment in Bioreactor No.1 (BR1). • Electrical Installation in 11kV HV Switchroom. • 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 7, 14, 21 and 28 June 2018 and for Contract No. DE/2014/01 were carried out on 7, 14, 21 and 28 June 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/m3)	Exceedance due to the Project Construction (Yes/No)
AM1	No. 31 Wai Loi Tsuen	47-87	286	500	No
AM2	Fu Tei Au	51-83	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/m3)	Exceedance due to the Project Construction (Yes/No)
AM1	No. 31 Wai Loi Tsuen	14-38	147	260	No
AM2a	RE's Site Office	11-37	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	54-60	When one documented complaint is received	>75	No
NM2	Fu Tei Au	56-62		>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)	22.09	0.27	22.36	Tuen Mun 38
Hard Rock and Large Broken Concrete (Inert) (in '000m^3)	2.24	0	2.24	Tuen Mun 38
Reused in this Project (Inert) (in '000m^3)	3.37	0.1	3.47	--
Reused in other Projects (Inert) (in '000m^3)	2.23	0	2.23	
Disposal as Public Fill (Inert) (in '000m^3)	14.35	0.17	14.52	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)	1.03	0.07	1.11	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)	13.47	8.24	21.71	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 June 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: 7, 14, 21 and 28 June 2018
Contract No. DE/2014/01: 7, 14, 21 and 28 June 2018

6.1.5 IEC conducted site audit on 28 June 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

33RD MONTHLY ENVIRONMENTAL MONITORING AND AUDIT (EM&A) REPORT – JUNE 2018

PREPARED FOR

TSUN YIP WATERWORKS CONSTRUCTION CO LTD

Date	Reference No.	Prepared By	Certified By
13 July 2018	TCS00757/15/600/R0125v2	Martin Li (Environmental Consultant)	Tam Tak Wing (Environmental Team Leader)

Version	Date	Remarks
1	10 July 2018	First Submission
2	13 July 2018	Amended against IEC's comments

EXECUTIVE SUMMARY

ES.01 This is the **33rd** Monthly Environmental Monitoring and Audit Report covering the period from **1** to **30 June 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	**36**
	24-hour TSP	**12**
Construction Noise	$L_{Aeq(30min)}$ Daytime	**8**
Inspection / Audit	ET Regular Environmental Site Inspection	**4**
	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 30 June 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 30 June 2018	0	0	NA

Reporting Period	Environmental Prosecution Statistics		
	Frequency	Cumulative	Complaint Nature
1 to 30 June 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 **7, 14, 21 and 28 June 2018**. Furthermore, IEC attend site inspection was on **28 June 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
- Excavation Works for pipe laying and for E&M cable duct installation - Concreting Works for the wall and roof slab of LV switch room.	- Dust impact from excavation work, dusty material handling and during concrete production - Muddy runoff water generated from the dusty material stockpile during rainy days.	- Implement dust suppression measures during excavation work and for any excavated dusty material. - Implement construction site runoff control practices and measures at all times

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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 **33rd** Monthly EM&A Report presenting the monitoring results and inspection findings for the reporting period from **1** to **30 June 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 STATUES 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:-

Portion A

- Concreting the wall and roof slab of LV switch room
- Excavation of DN80, DN100 and DN300 pumping pipe outside MFB
- Installation of FRP hand-railing at membrane facilities building
- Excavation of trench for installation of E&M cable duct
- Footpath and roadwork reinstatement
- Interior and exterior decoration of chemical room and LV switch room
- Excavation and pipe laying and manhole construction for drainage works

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	• 1-hour TSP by Real-Time Portable Dust Meter; and • 24-hour TSP by High Volume Air Sampler.
Construction Noise	• $Leq_{(30min)}$ 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
24-Hr TSP	
High Volume Air Sampler	TISCH High Volume Air Sampler, HVS Model TE-5170
Calibration Kit	TISCH Model TE-5025A
1-Hour TSP	
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, μg m^{-3}

Monitoring Stations	Action Level ($\mu g/m^3$)		Limit Level ($\mu g/m^3$)	
	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 90^0 light scattering. The 1-hour TSP monitor consisted of the following:

a. A pump to draw sample aerosol through the optic chamber where TSP is measured;
b. A sheath air system to isolate the aerosol in the chamber to keep the optics clean for maximum reliability; and
c. 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:

a. An anodized aluminum shelter;
b. A 8"x10" stainless steel filter holder;
c. A blower motor assembly;
d. A continuous flow/pressure recorder;
e. A motor speed-voltage control/elapsed time indicator;
f. A 7-day mechanical timer, and
g. 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, µg/m³

DATE	AM1				AM2			
	Start Time	1st Meas.	2nd Meas.	3rd Meas.	Start Time	1st Meas.	2nd Meas.	3rd Meas.
4-Jun-18	9:14	66	72	61	13:09	79	60	56
9-Jun-18	8:47	87	79	64	8:59	83	77	66
15-Jun-18	9:29	61	61	63	9:35	62	72	66
20-Jun-18	9:15	62	72	66	9:22	64	70	64
26-Jun-18	13:00	47	53	50	13:10	53	51	57
29-Jun-18	9:15	69	64	59	9:24	74	68	64
Average (Range)	**64 (47 - 87)**				**66 (51 - 83)**			

Table 5-2 Summary of 24-hour TSP Monitoring Results, µg/m³

Date	AM1	AM2a
1-Jun-18	20	57
7-Jun-18	38	44
13-Jun-18	16	11
19-Jun-18	18	43
25-Jun-18	14	36
30-Jun-18	16	28
Average (Range)	**20 (14 - 38)**	**57 (11-37)**

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 91.0µg/m³ 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	($L_{eq30min}$)
4-Jun-18	9:19	60	10:33	58
15-Jun-18	11:13	54	10:06	56
20-Jun-18	11:00	60	11:35	62
26-Jun-18	13:00	60	13:40	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)	22.09	0.27	22.36	Tuen Mun 38
Hard Rock and Large Broken Concrete (Inert) (in '000 m^3)	2.24	0.00	2.24	Tuen Mun 38
Reused in this Project (Inert) (in '000 m^3)	3.37	0.10	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)	14.35	0.17	14.52	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)	1.03	0.07	1.11	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 **7, 14, 21 and 28 June 2018.** Furthermore, IEC attend site inspection was on **28 June 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
07 June 2018	• No adverse environmental issues were observed.	• NA
14 June 2018	• No adverse environmental issues were observed	• NA
21 June 2018	• Open stockpiles was observed on the ground next to main building. The Contractor should cover it with tarpaulin sheets to avoid dust emission..	• Stockpile was removed from site.
28 June 2018	• No adverse environmental issues were observed	• NA

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 30 June 2018	0	0	NA

Table 8-2 Statistical Summary of Environmental Summons

Reporting Period	Environmental Summons Statistics		
	Frequency	Cumulative	Complaint Nature
1 to 30 June 2018	0	0	NA

Table 8-3 Statistical Summary of Environmental Prosecution

Reporting Period	Environmental Prosecution Statistics		
	Frequency	Cumulative	Complaint Nature
1 to 30 June 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	• Wastewater to be treated by the filtration systems i.e. sedimentation tank before to discharge.
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.
Waste and 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
General	• 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.

- External finishing of chemical storage room and LV switch room
- Concreting of wall and roof slab of LV switch room
- Removal of formwork of wall and roof slab of LV switch room
- Construction of DN150 fire services main
- Construction of plinth support and concrete gantry of DN1400 pipe at BR1
- Excavation of DN350 pipe near pretreatment chamber
- Excavation of trench for installation of E&M cable duct
- Installation of FRP railing at membrane tank
- Installation of multi part cover of manhole E3A
- Construction of underground drainage pipe and manhole
- Footpath and road work construction

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
- Excavation Works for pipe laying and for E&M cable duct installation	- Dust impact from excavation work, dusty material handling and during concrete production	- Implement dust suppression measures during excavation work and for any excavated dusty material.
- Concreting Works for the wall and roof slab of LV switch room.	- Muddy runoff water generated from the dusty material stockpile during rainy days.	- Implement construction site runoff control practices and measures at all times

10 CONCLUSIONS AND RECOMMENTATIONS

10.1 CONCLUSIONS

10.1.1 This is the **33rd** Monthly EM&A report, covering the construction period from **1 to 30 June 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 **7, 14, 21 and 28 June 2018**. Furthermore, IEC attend site inspection was on **28 June 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.

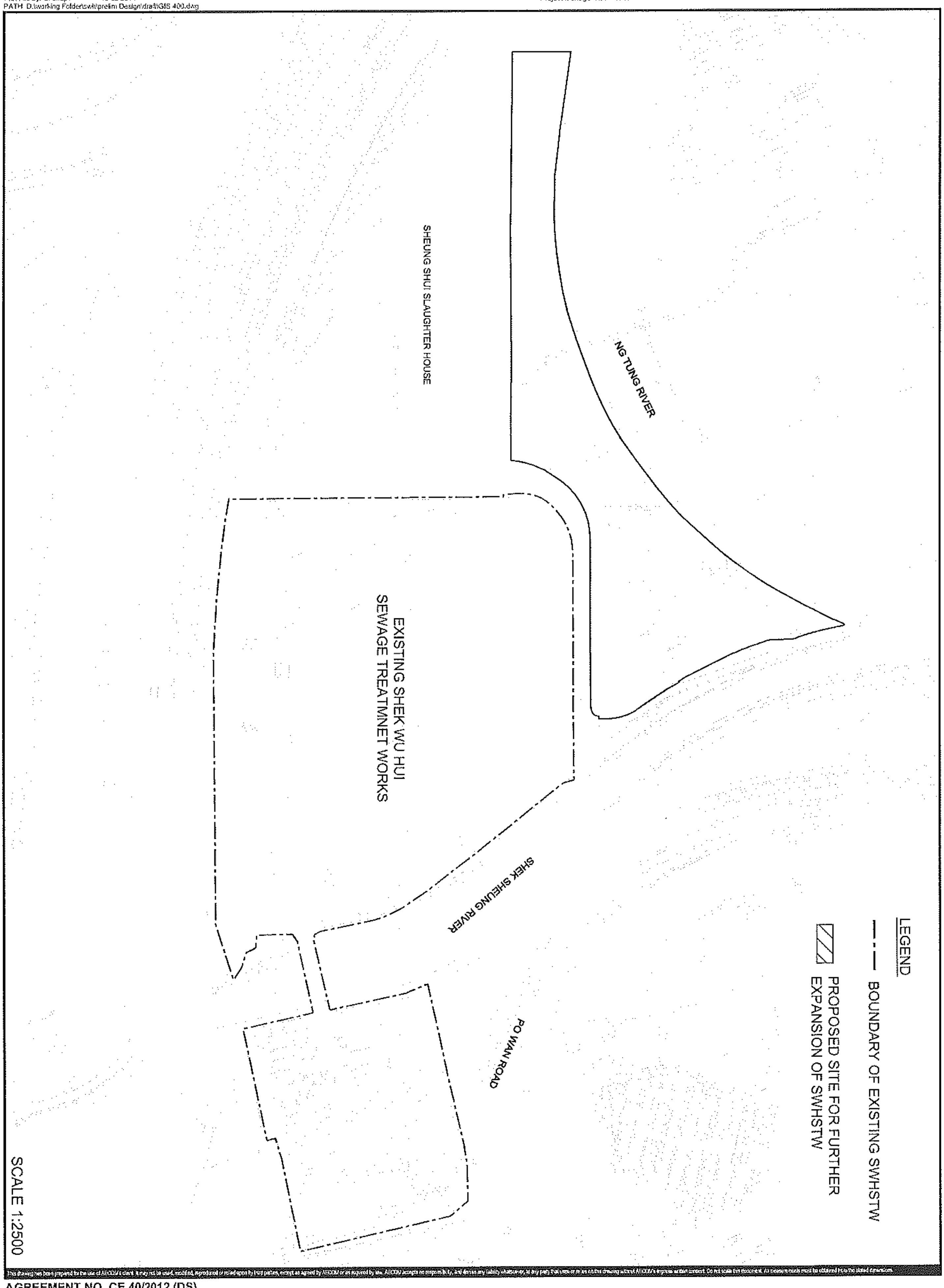
10.2.3 To control the site performance on waste management, Tsun Yip shall ensure that all solid and liquid waste management works are fully in compliance with the relevant license/permit requirements, such as the effluent discharge licence and the chemical waste producer registration. Tsun Yip is also 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

Plot File by: Chancp1 19/02/2014
PATH D:\working Folder\swh\prelim Design\draft\GIS 400.dwg

Project Management Initials: Checked: CYKY ISO A3 297mm x 420mm



AGREEMENT NO. CE 40/2012 (DS)
SHEK WU HUI SEWAGE TREATMENT WORKS
- FURTHER EXPANSION PHASE 1A
- INVESTIGATION
Project No.: 60284037 Date: FEB. 2014

LOCATION OF THE EXISTING SWHSTW AND THE
PROPOSED SITE FOR FURTHER EXPANSION

AECOM

Drawing 60284037/EM&AM/400

Plot File by: Chancp1 19/02/2014
PATH: D:\working Folders\wh\prelim Design\draft\GIS 401.dwg

Project Management Initials: Checked: CYKY ISO A3 297mm x 420mm

ZONE	EXISTING USAGE	PROPOSED USAGE
A	SLUDGE TREATMENT (SOLID STREAM) AND ANCILLARY FACILITIES	ANCILLARY FACILITIES
B	SEWAGE TREATMENT (LIQUID STEAM)	SEWAGE TREATMENT (LIQUID STREAM)
C	TEMPORARY WORKS SITE	SLUDGE TREATMENT (SOLID STREAM)
D	VACANT	RECLAIMED WATER FACILITIES

SCALE 1:2500

AGREEMENT NO. CE 40/2012 (DS)
SHEK WU HUI SEWAGE TREATMENT WORKS
- FURTHER EXPANSION PHASE 1A
- INVESTIGATION
Project No.: 60284037 Date: FEB. 2014

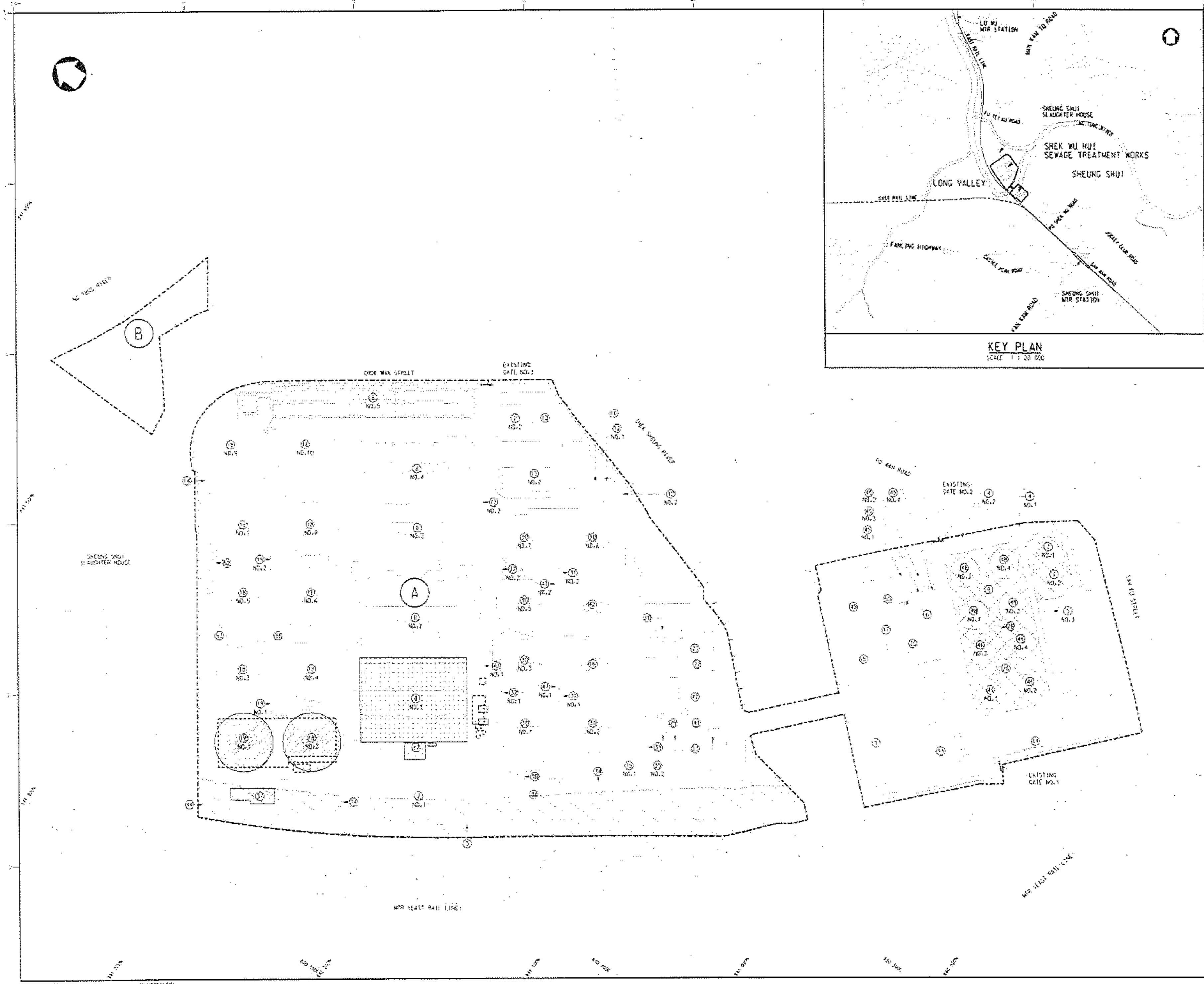
PREFERRED SITE UTILIZATION
ACCORDING TO BRIEF

AECOM

Drawing 60284037/EM&AM/401

Appendix B

LAYOUT PLAN OF ADVANCE WORKS



NOTES

1. ALL GRIDS REFER TO HONG KONG 1980 GRID.
2. THE CONTRACTOR'S ATTENTION IS DRAWN TO THE REQUIREMENTS OF SCC 22 AND PS CLAUSES [illegible] AND PS APPENDIX [illegible] FOR WORKS IN THE VICINITY OF [illegible].
3. PORTION 'A' IS INSIDE EXISTING SWHSTW. THE CONTRACTOR'S ATTENTION IS DRAWN TO THE REQUIREMENTS OF PS CLAUSE [illegible] AND [illegible] FOR WORKS INSIDE SWHSTW.
4. THE CONTRACTOR'S ATTENTION IS DRAWN TO PS SECTION 28 FOR THE SAFETY REQUIREMENTS FOR WORKS IN GAS RISK AREA.
5. CHOK WAN STREET IS THE MAIN ACCESS FOR THE SHEUNG SHUI SLAUGHTER HOUSE. THE CONTRACTOR SHALL TAKE SPECIAL PRECAUTION TO ENSURE THE CHOK WAN STREET WILL NOT BE AFFECTED FOR ANY OF HIS WORKS NEARBY.

LEGEND 1

- SITE BOUNDARY
- GAS RISK AREA
- AREA WITHIN WHICH SCC 22 AND PS CLAUSES [illegible] AND [illegible] & PS APPENDIX [illegible] SHALL APPLY
- EXISTING STRUCTURE TO BE DEMOLISHED
- EXISTING STRUCTURE TO BE MODIFIED
- PROPOSED STRUCTURE
- PORTION A OF THE SITE

REVISION

	name	date
designed		12 DEC 2014
drawn		12 DEC 2014
checked		12 DEC 2014
vetted		12 DEC 2014
approved	Chief Engineer	12 DEC 2014

contract no: DC/2013/09

file no: SPB/438BDS

project no: 438BDS

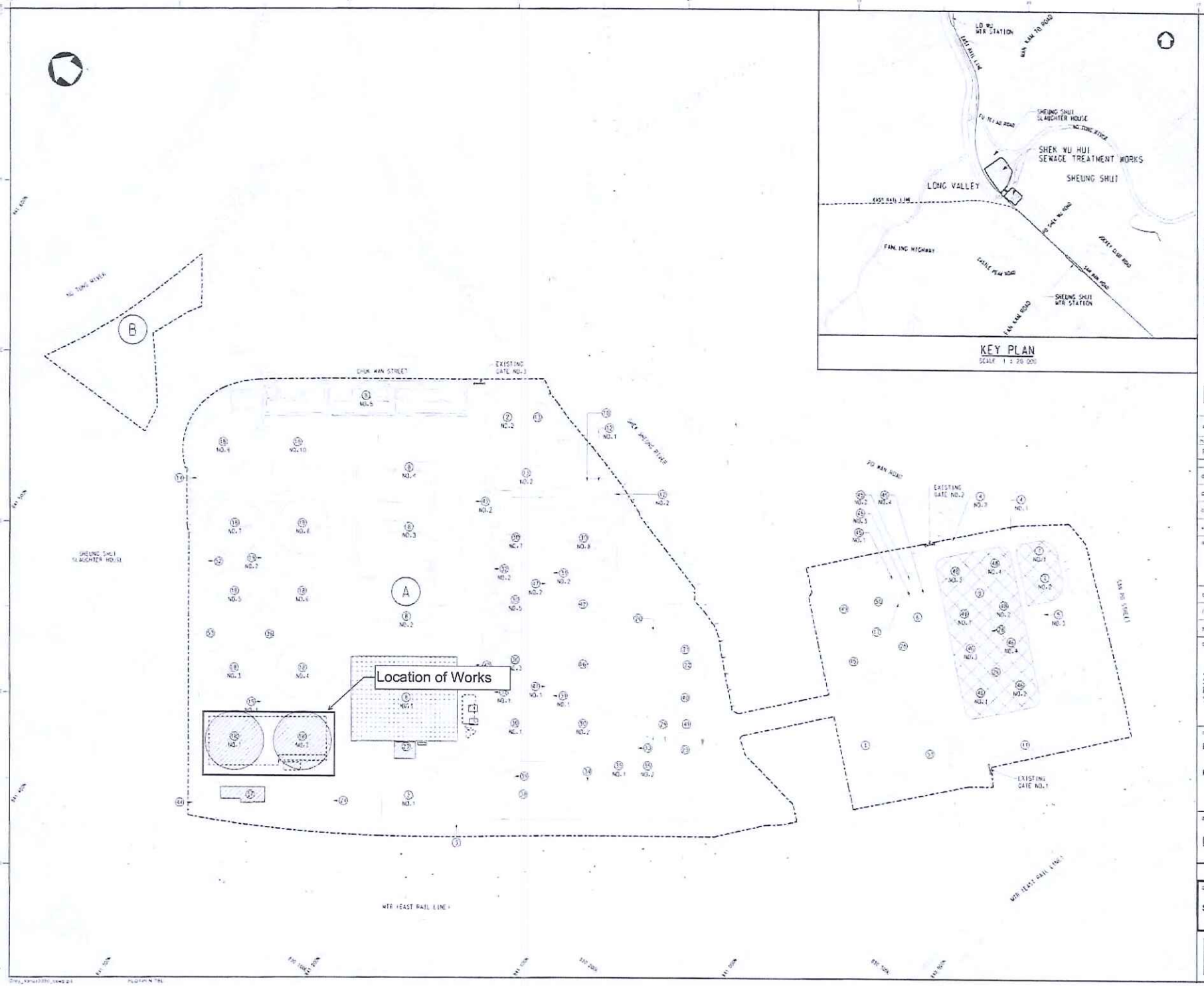
contract: ADVANCE WORKS FOR SHEK WU HUI SEWAGE TREATMENT WORKS - FURTHER EXPANSION PHASE 1A AND SEWERAGE WORKS AT PING CHE ROAD

drawing title: PORTION A - PORTIONS OF THE SITE

drawing no: DSP/DC1309/11021

office: SEWERAGE PROJECTS DIVISION

DRAINAGE SERVICES DEPARTMENT
GOVERNMENT OF THE HONG KONG SPECIAL ADMINISTRATIVE REGION



NOTES

1. ALL GRIDS REFER TO HONG KONG 1980 GRID.
2. THE CONTRACTOR'S ATTENTION IS DRAWN TO THE REQUIREMENTS OF ETWB TC(W) No.22/2002 AND PS CLAUSES 1.66(10) AND PS APPENDIX 1.19 FOR WORKS IN THE VICINITY OF MTRCL.
3. PORTION 'A' IS INSIDE EXISTING SSWSTW. THE CONTRACTOR'S ATTENTION IS DRAWN TO THE REQUIREMENTS OF PS CLAUSE 1.45 AND 28.27 FOR WORKS INSIDE SSWSTW.
4. THE CONTRACTOR'S ATTENTION IS DRAWN TO PS SECTION 20 FOR THE SAFETY REQUIREMENTS FOR WORKS IN GAS RISK AREA.
5. CHUK WAN STREET IS THE MAIN ACCESS FOR THE SHEUNG SHUI SLAUGHTER HOUSE. THE CONTRACTOR SHALL TAKE SPECIAL PRECAUTION TO ENSURE THE CHUK WAN STREET WILL NOT BE AFFECTED FOR ANY OF HIS WORKS NEARBY.

LEGEND :

- SITE BOUNDARY
- GAS RISK AREA
- EXISTING STRUCTURE TO BE DEMOLISHED
- EXISTING STRUCTURE TO BE MODIFIED
- PROPOSED STRUCTURE
- (A) PORTION A OF THE SITE

FOR TENDER PURPOSES ONLY

No.	Date	Description	Checked
A	29 JAN 2015	GENERAL REVISION	

REVISION

	Name	Date
designed	SIGNED	12 DEC 2014
drawn	SIGNED	12 DEC 2014
checked	SIGNED	12 DEC 2014
vetted	SIGNED	12 DEC 2014

approved

SIGNED
Chief Engineer — 12 DEC 2014 Date

contract no	DC/2013/09
file no	SPB/4388DS
project no	4388DS

contract

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

drawing title

PORTION A -

PORTIONS OF THE SITE

drawing no	scale
DSP/DC1309/11021A	1 : 1000 OR AS SHOWN

office

SEWERAGE PROJECTS DIVISION

DRAINAGE SERVICES DEPARTMENT
GOVERNMENT OF THE
HONG KONG
SPECIAL ADMINISTRATIVE REGION

Appendix C

ORGANIZATION STRUCTURE AND CONTACT DETAILS OF RELEVANT PARTIES

TSUN YIP

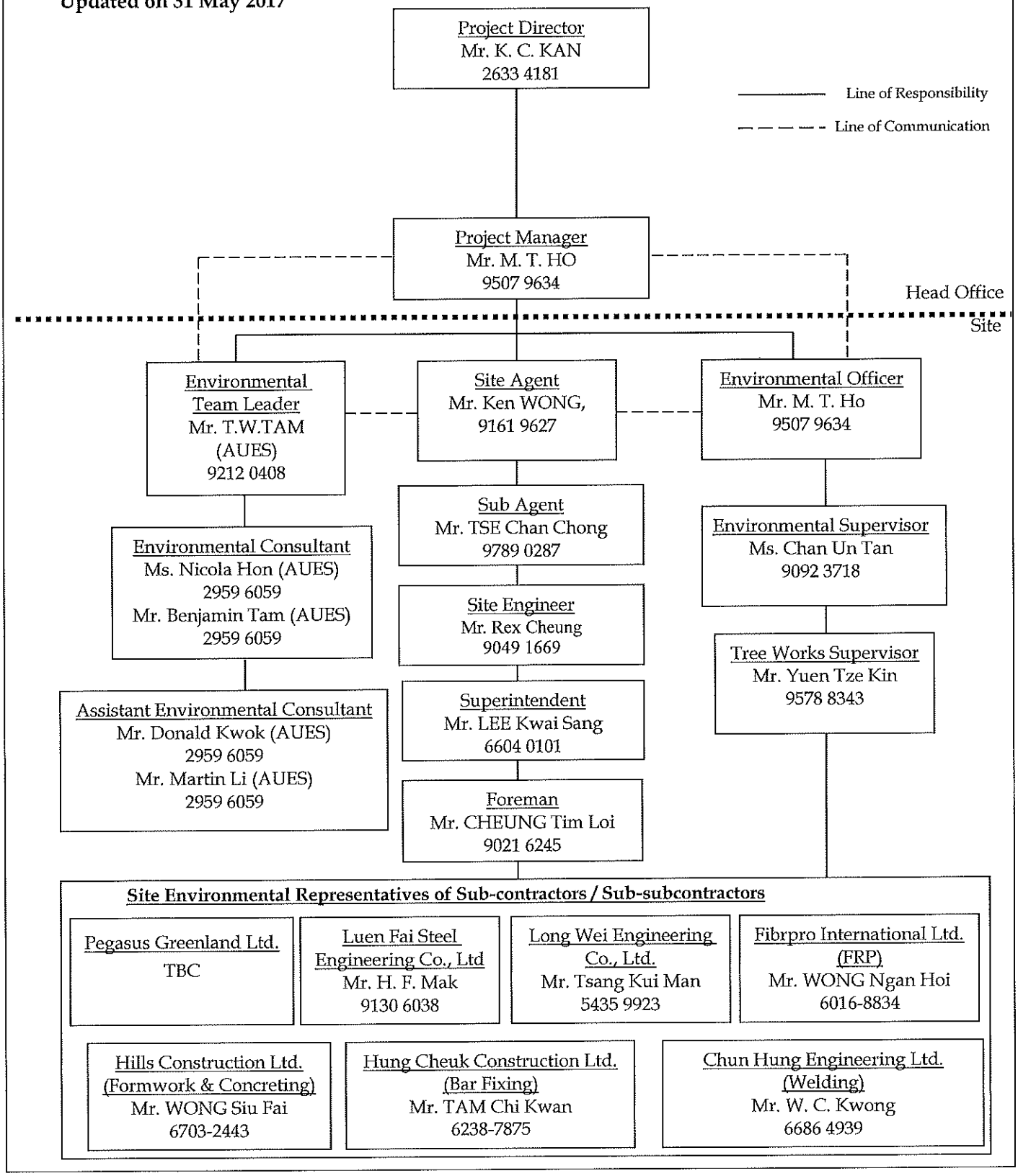
Tsun Yip Waterworks Construction Company Limited
進業水務建築有限公司

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



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

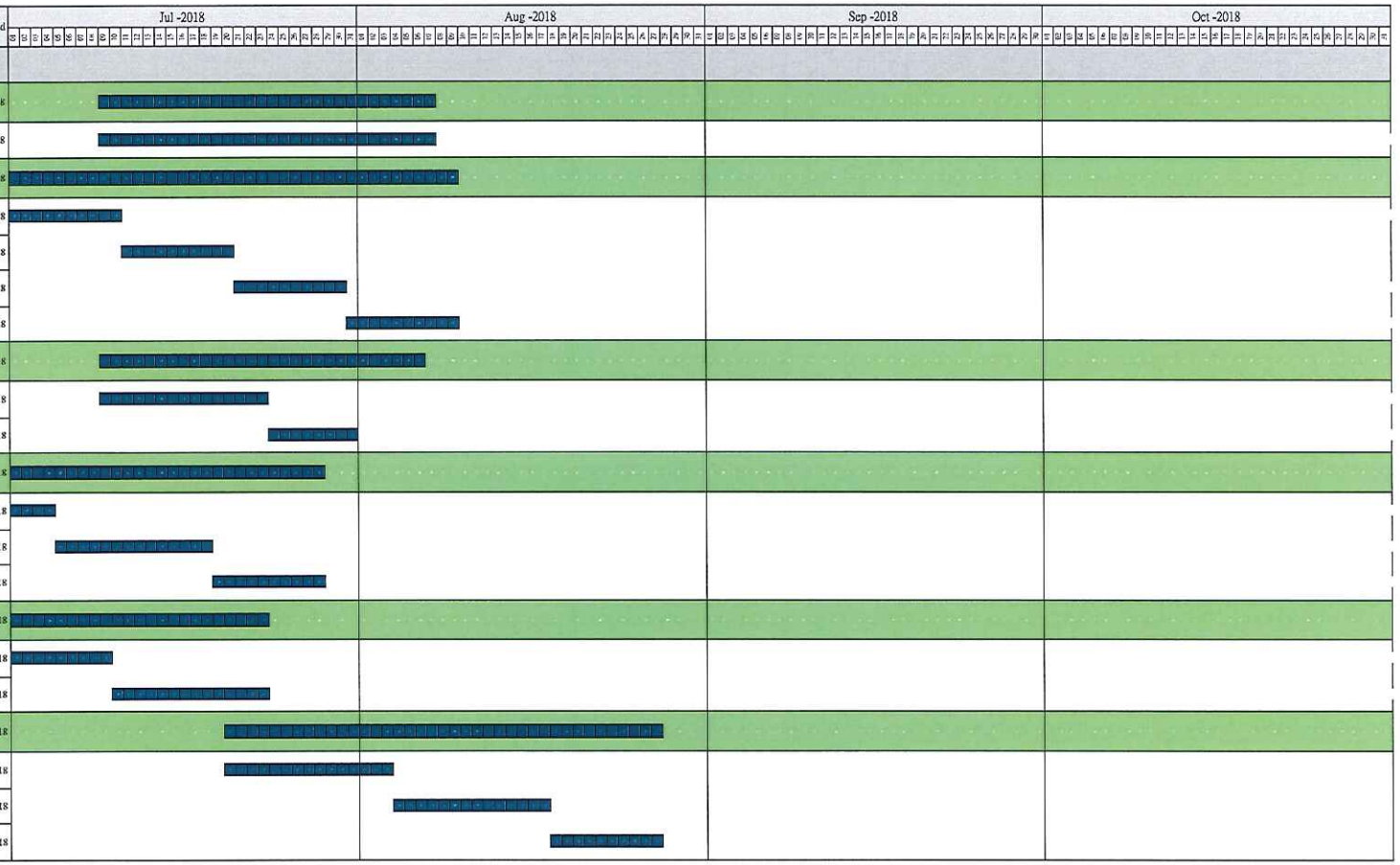
AUES (ET) – Action-United Environmental Services & Consulting

Appendix D

3-MONTH ROLLING PROGRAM

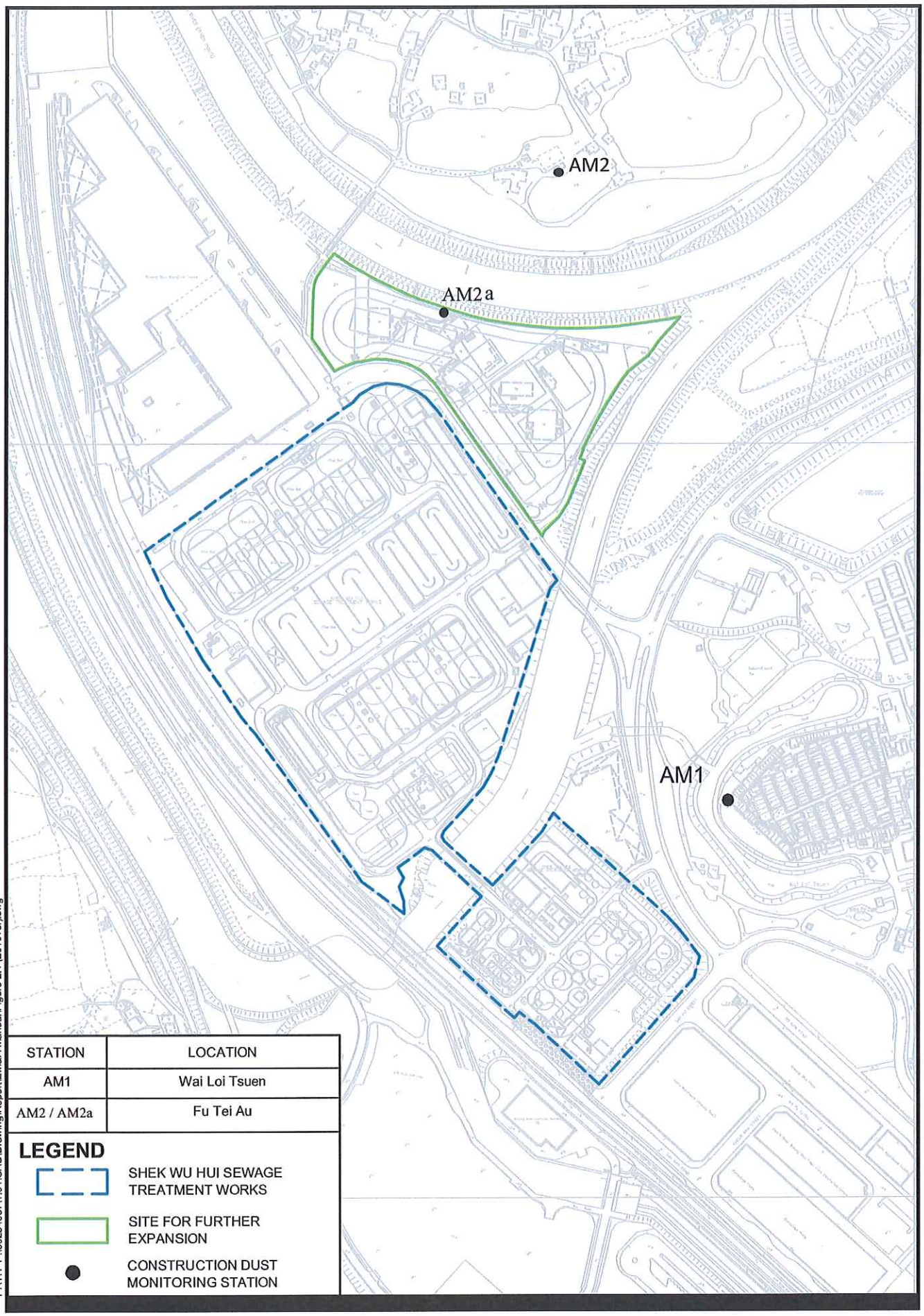
Contract No. DC/2013/09
Advance Works for Shek Wu Hui Sewage Treatment Works - Further Expansion Phase 1A and Sewerage Works at Ping Che Road
3-Month Rolling Programme (Shek Wu Hui Sewage Treatment Works - Section 3) in July 2018

Item	Description	Duration (Days)	% of Completion	Start	Finished
	Shek Wu Hui Sewage Treatment Works - Section 3				
1	*6x 150mm* Cable Ducts Installation and Draw Pit Construction	30	28%	09/07/18	07/08/18
1.5	V.O.12 - Remaining Duct Laying (outside BR1 to MT)	30	80.0%	09/07/18	07/08/18
2	*Road Works (Footway reinstatement around MFB)*	41	0%	30/06/18	09/08/18
2.1	Laying Sub-Base Material	10	30.0%	30/06/18	10/07/18
2.2	Laying Road Surface Concrete	10	30.0%	11/07/18	20/07/18
2.3	Construction of Road Kerb	10	30.0%	21/07/18	30/07/18
2.4	Reinstatement of U-Channel with cover	10	0.0%	31/07/18	09/08/18
3	*Road Drainage Work (Carriageway and footway from MFB to Chemical Room)*	29	0%	09/07/18	06/08/18
3.1	Installation of 225 Precast Concrete Drain Pipe	14	0.0%	09/07/18	23/07/18
3.2	Construction of Road Gullies and Drainage Manhole	14	0.0%	24/07/18	06/08/18
4	*Road Works (Carriageway and footway from FST NO.7 to MFB)*	39	0%	20/06/18	28/07/18
4.1	Construction of Road Kerb	14	0.0%	20/06/18	04/07/18
4.2	Laying Sub-Base Material	14	0.0%	05/07/18	18/07/18
4.3	Laying Road Surface Concrete	10	0.0%	19/07/18	28/07/18
5	*Road Drainage Work (Carriageway and footway from Pre-Treatment Chamber to MFB)*	29	0%	25/06/18	23/07/18
5.1	Installation of 225 Precast Concrete Drain Pipe	14	0.0%	25/06/18	09/07/18
5.2	Construction of Road Gullies and Drainage Manhole	14	0.0%	10/07/18	23/07/18
6	*Road Works (Carriageway and footway from Pre-Treatment Chamber to MFB)*	39	0%	20/07/18	27/08/18
6.1	Construction of Road Kerb	14	0.0%	20/07/18	03/08/18
6.2	Laying Sub-Base Material	14	0.0%	04/08/18	17/08/18
6.3	Laying Road Surface Concrete	10	0.0%	18/08/18	27/08/18



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

ISO A4 210mm x 297mm

Checked:

Project Management Initials:

Plot File by: Shumyjl 26/02/2014
PATH P:\60284037\1.01\CAD\Drawing\Report\EM&A Manual\Figure 2.1 (2010ver).dwg

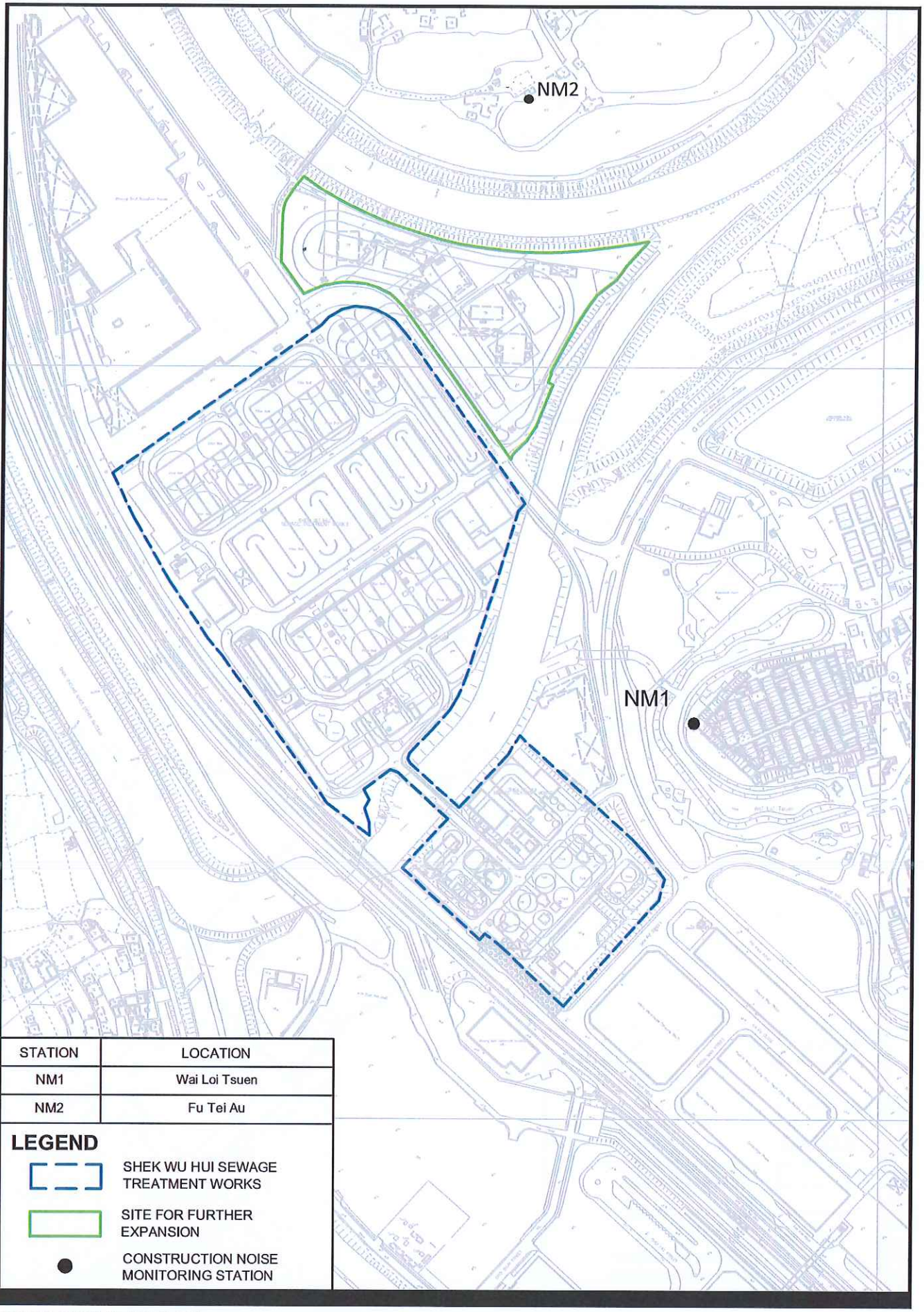
AGREEMENT NO. CE 40/2012 (DS)
SHEK WU HUI SEWAGE TREATMENT WORKS
- FURTHER EXPANSION PHASE 1A
- INVESTIGATION

PROPOSED CONSTRUCTION DUST MONITORING STATIONS FOR CONSTRUCTION PHASE AND OPERATION PHASE

AECOM

Project No.: 60284037 Date: FEB. 2014

Drawing No.
60284037/EM&AM/405



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

ISO A4 210mm x 297mm

Checked:

Project Management Initials:

Plot File by: Shumyjl 26/02/2014
PATH P:\60284037\11.01\CAD\Drawing\Report\EM&A Manual\Figure 3.1 (2010ver).dwg

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

LOCATIONS OF CONSTRUCTION NOISE MONITORING STATIONS

AECOM

Project No.: 60284037 Date: FEB. 2014

Drawing No.
60284037/EM&AM/407

Appendix F

EVENT ACTION PLAN

Event and Action Plan for Construction Dust

Event	Action			
	ET	IEC	ER	Contractor
Action level being exceeded by one sampling	1. Identify source, investigate the causes of complaint and propose remedial measures; 2. Inform IEC and ER; 3. Repeat measurement to confirm finding; 4. Increase monitoring frequency to daily.	1. Check monitoring data submitted by ET; 2. Check Contractor's working method.	1. Notify Contractor.	1. Rectify any unacceptable practice; 2. Amend working methods if appropriate.
Action level being exceeded by two or more consecutive sampling	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.	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.	1. Confirm receipt of notification of exceedance in writing; 2. Notify Contractor; 3. Ensure remedial measures properly implemented.	1. Submit proposals for remedial actions to IEC within three working days of notification; 2. Implement the agreed proposals; 3. Amend proposal if appropriate.
Limit level being exceeded by one sampling	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.	1. Check monitoring data submitted by ET; 2. Check Contractor's working method; 3. Discuss with ET and Contractor on possible remedial measures; 4. Advise the ER on the effectiveness of the proposed remedial measures; 5. Supervise implementation of remedial measures.	1. Confirm receipt of notification of exceedance in writing; 2. Notify Contractor; 3. Ensure remedial measures properly implemented.	1. Take immediate action to avoid further exceedance; 2. Submit proposals for remedial actions to IEC within three working days of notification; 3. Implement the agreed proposals; 4. Amend proposal if appropriate.
Limit level being exceeded by two or more consecutive sampling	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 taken; 7. Assess effectiveness of Contractor's remedial actions and keep IEC, EPD and ER informed of the results; 8. If exceedance stops, cease additional monitoring.	1. Discuss amongst ER, ET, and Contractor on the potential remedial actions; 2. Review Contractor's remedial actions whenever necessary to assure their effectiveness and advise the ER accordingly; 3. Supervise the implementation of remedial measures.	1. Confirm receipt of notification of 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, consider what portion of the work is responsible and instruct the Contractor to stop that portion of work until the exceedance is abated.	1. Take immediate action to avoid further exceedance; 2. Submit proposals for remedial actions to IEC within three 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.

Event and Action Plan for Construction Noise

Event	Action			
	ET	IEC	ER	Contractor
Action Level	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.	1. Review the analysed results submitted by the ET; 2. Review the proposed remedial measures by the Contractor and advise the ER accordingly; 3. Supervise the implementation of remedial measures.	1. Confirm receipt of notification of failure in writing; 2. Notify Contractor; 3. Require Contractor to propose remedial measures for the analysed noise problem; 4. Ensure remedial measures are properly implemented.	1. Submit noise mitigation proposals to IEC; 2. Implement noise mitigation proposals.
Limit Level	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.	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.	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.	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 : No. 31 Wai Loi Tsuen
Location ID : AM1

Date of Calibration: 2-May-18
Next Calibration Date: 2-Jul-18
Technician: Fai So

CONDITIONS

Sea Level Pressure (hPa)	1012.5	Corrected Pressure (mm Hg)	759.375
Temperature (℃)	21.3	Temperature (K)	294

CALIBRATION ORIFICE

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

CALIBRATION

Plate No.	H20 (L) (in)	H2O (R) (in)	H20 (in)	Qstd (m3/min)	I (chart)	IC corrected	LINEAR REGRESSION
18	6.30	5.90	12.2	1.757	52	52.63	Slope = 25.7790
13	5.30	5.30	10.6	1.639	48	48.58	Intercept = 6.7618
10	4.20	3.80	8.0	1.427	43	43.52	Corr. coeff. = 0.9981
7	2.20	2.20	4.4	1.063	33	33.40	
5	1.50	1.30	2.8	0.851	29	29.35	

Calculations :

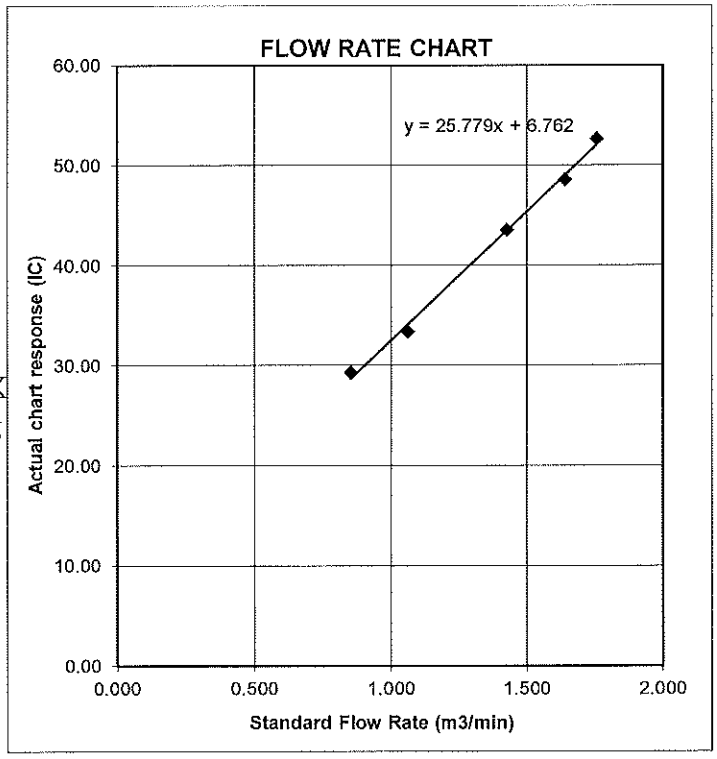
Qstd = 1/m[Sqrt(H20(Pa/Pstd)(Tstd/Ta))-b]
IC = I[Sqrt(Pa/Pstd)(Tstd/Ta)]

Qstd = standard flow rate
IC = corrected chart respones
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)[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 : RE's Site Office
Location ID : AM2a

Date of Calibration: 2-May-18
Next Calibration Date: 2-Jul-18
Technician: Fai So

CONDITIONS

Sea Level Pressure (hPa)	1012.4	Corrected Pressure (mm Hg)	759.3
Temperature (°C)	27.9	Temperature (K)	301

CALIBRATION ORIFICE

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

CALIBRATION

Plate No.	H20 (L) (in)	H2O (R) (in)	H20 (in)	Qstd (m3/min)	I (chart)	IC corrected	LINEAR REGRESSION
18	6.10	6.30	12.4	1.752	53	52.47	Slope = 25.5774
13	5.50	5.40	10.9	1.644	49	48.51	Intercept = 7.0745
10	4.10	4.10	8.2	1.428	44	43.56	Corr. coeff. = 0.9991
7	2.30	2.00	4.3	1.039	34	33.66	
5	1.40	1.40	2.8	0.842	29	28.71	

Calculations :

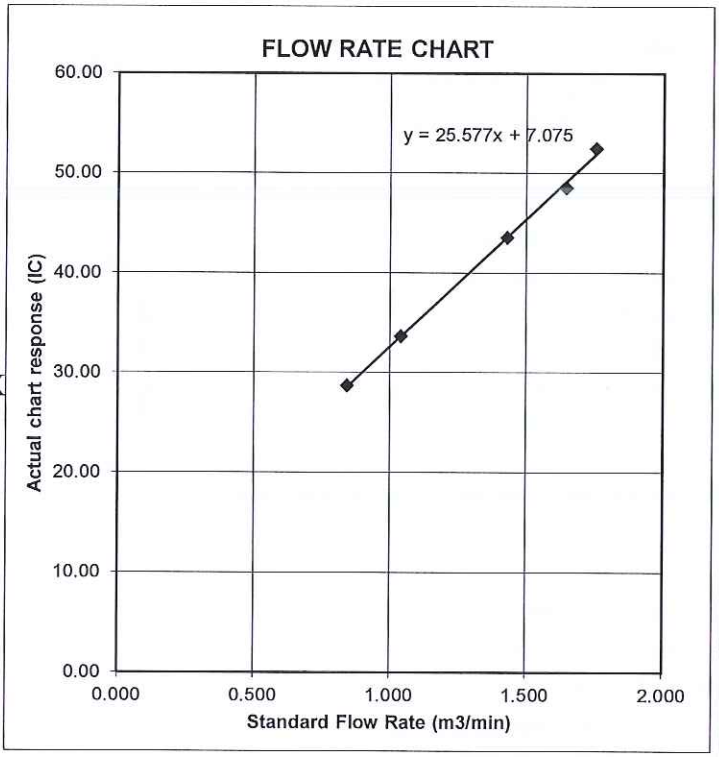
Qstd = 1/m[Sqrt(H20(Pa/Pstd)(Tstd/Ta))-b]
IC = I[Sqrt(Pa/Pstd)(Tstd/Ta)]

Qstd = standard flow rate
IC = corrected chart respones
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)[Sqrt(298/Tav)(Pav/760)]-b)

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



TISCH Environmental

RECALIBRATION DUE DATE:
February 13, 2019

Certificate of Calibration

Calibration Certification Information				
Cal. Date:	February 13, 2018	**Rootsmeter 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)	$\sqrt{\Delta H\left(Ta/Pa\right)}$ (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=	ΔVol((Pa-ΔP)/Pstd)(Tstd/Ta)	**Va=**	ΔVol((Pa-ΔP)/Pa)
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= $1/m\left(\left(\sqrt{\Delta H\left(Ta/Pa\right)}\right)-b\right)$

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

RECALIBRATION

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

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

www.tisch-env.cor
TOLL FREE: (877)263-761(
FAX: (513)467-900

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 2018	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.
- 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*
p.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/m³ (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)

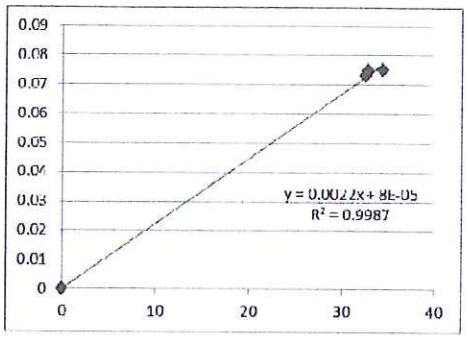
Sensitivity Adjustment Scale Setting (After Calibration) 566 (CPM)

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 : Date : 15 March 2018

QC Reviewer : Ben Tam 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.	H20 (L) (in)	H2O (R) (in)	H20 (in)	Qstd (m3/min)	I (chart)	IC corrected
18	6.2	6.2	12.4	1.694	52	52.63
13	5.1	5.1	10.2	1.538	46	46.55
10	3.9	3.9	7.8	1.346	40	40.48
8	2.6	2.6	5.2	1.101	30	30.36
5	1.7	1.7	3.4	0.893	20	20.24

LINEAR REGRESSION

Slope =	39.8525
Intercept =	-14.3322
Corr. coeff. =	0.9974

Calculations :

Qstd = 1/m[Sqrt(H20(Pa/Pstd)(Tstd/Ta))-b]

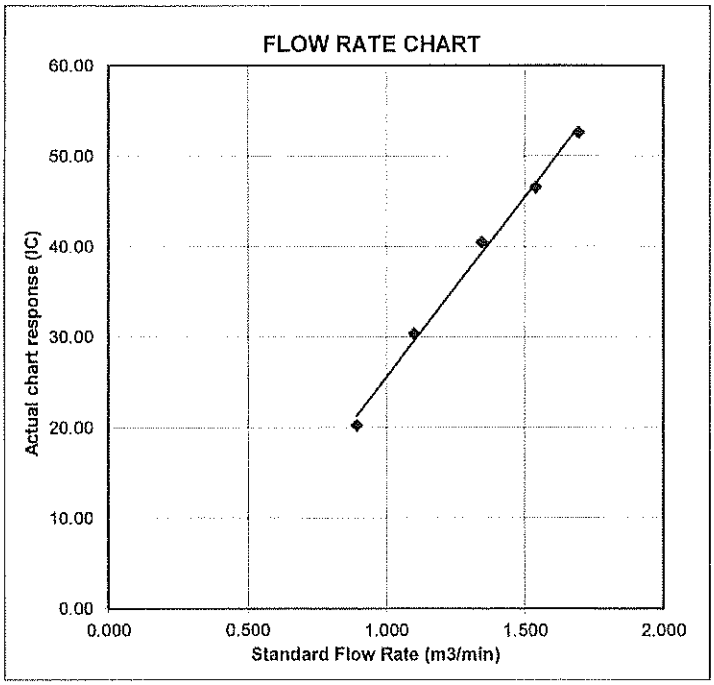
IC = I[Sqrt(Pa/Pstd)(Tstd/Ta)]

Qstd = standard flow rate
IC = corrected chart respones
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)[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.

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	: 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/m³ (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)

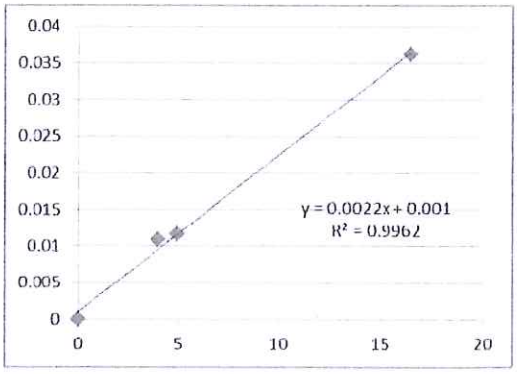
Sensitivity Adjustment Scale Setting (After Calibration) 583 (CPM)

Linear Regression of Y or X

Slope (K-factor): 0.0022

Correlation Coefficient 0.9981

Date of Issue 9 January 2018



Remarks:

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 : Date : 9 January 2018

QC Reviewer : Ben Tam 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.	H20 (L) (in)	H2O (R) (in)	H20 (in)	Qstd (m3/min)	I (chart)	IC corrected	LINEAR REGRESSION	
18	6.3	6.3	12.6	1.703	54	54.49	Slope =	31.2239
13	5	5	10.0	1.518	48	48.44	Intercept =	0.7901
10	3.9	3.9	7.8	1.342	42	42.38	Corr. coeff. =	0.9971
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[Sqrt(H20(Pa/Pstd)(Tstd/Ta))-b]

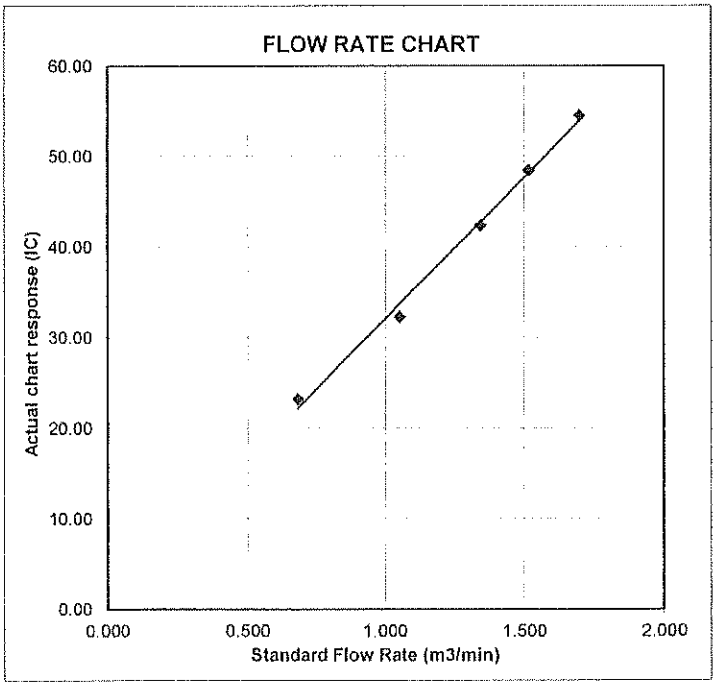
IC = I[Sqrt(Pa/Pstd)(Tstd/Ta)]

Qstd = standard flow rate
IC = corrected chart respones
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)[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 ± 2)°C Relative Humidity / 相對濕度 : (50 ± 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 簽發日期 : 15 May 2018

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 — 校正及檢測實驗所
c/o 香港新界屯門興安里一號四樓
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

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 :

Equipment ID	Description	Certificate No.
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	IEC 61672
Range (dB)	Function	Frequency Weighting	Time Weighting	Level (dB)	Freq. (kHz)	Reading (dB)	Class 1 Spec. (dB)
30 - 130	L_A	A	Fast	94.00	1	94.3	± 1.1

6.1.2 Linearity

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

Sun Creation Engineering Limited -- Calibration & Testing Laboratory
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c/o 香港新界屯門興安里一號四樓
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

UUT Setting				Applied Value		UUT Reading (dB)	IEC 61672 Class 1 Spec. (dB)
Range (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

UUT Setting				Applied Value		UUT Reading (dB)	IEC 61672 Class 1 Spec. (dB)
Range (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.

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

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 ± 2)°C Relative Humidity / 相對濕度 : (50 ± 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 簽發日期 : 15 May 2018

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 — 校正及檢測實驗所
c/o 香港新界屯門興安里一號四樓
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

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

Certificate of Calibration
校正證書

Certificate No. : C182470
證書編號

1. The unit-under-test (UUT) was allowed to stabilize in the laboratory for over 12 hours before the commencement of the test.

2. The results presented are the mean of 3 measurements at each calibration point.

3. Test equipment :

Equipment ID	Description	Certificate No.
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.

Appendix H

IMPACT MONITORING SCHEDULE

Impact Monitoring Schedule for Reporting Month – June 2018

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

Impact Monitoring Schedule for next Reporting Period – 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	AVG AIR PRESS	STANDARD FLOW RATE	AIR VOLUME	FILTER WEIGHT (g)		DUST WEIGHT COLLECTED	24-Hr TSP (μg/m³)
		INITIAL	FINAL	(min)	MIN	MAX	AVG	(°C)	(hPa)	(m³/min)	(std m³)	INITIAL	FINAL	(g)	
1-Jun-18	22734	17249.32	17273.32	1440.00	25	25	25.0	30.2	1009.9	0.70	1004	2.6977	2.7178	0.0201	20
7-Jun-18	22740	17310.83	17334.84	1440.60	20	21	20.5	27.3	1004.3	0.53	758	2.6941	2.7228	0.0287	38
13-Jun-18	22739	17334.84	17358.85	1440.60	20	20	20.0	27.8	1006.5	0.51	731	2.7042	2.7156	0.0114	16
19-Jun-18	22861	17358.72	17382.87	1449.00	20	20	20.0	29.6	1003.6	0.50	730	2.7009	2.7137	0.0128	18
25-Jun-18	22880	17382.87	17406.87	1440.00	20	20	20.0	28.1	1008.9	0.51	731	2.6857	2.6963	0.0106	14
30-Jun-18	22913	17406.87	17430.55	1420.80	20	20	20.0	28.7	1006.2	0.51	719	2.6710	2.6826	0.0116	16

24-Hr TSP Monitoring Data for AM2a

DATE	SAMPLE NUMBER	ELAPSED TIME			CHART READING			AVG TEMP	AVG AIR PRESS	STANDARD FLOW RATE	AIR VOLUME	FILTER WEIGHT (g)		DUST WEIGHT COLLECTED	24-Hr TSP (μg/m³)
		INITIAL	FINAL	(min)	MIN	MAX	AVG	(°C)	(hPa)	(m³/min)	(std m³)	INITIAL	FINAL	(g)	
1-Jun-18	22733	13940.30	13964.30	1440.00	40	41	40.5	30.2	1009.9	1.29	1858	2.7067	2.8129	0.1062	57
7-Jun-18	22741	13964.30	13988.31	1440.60	40	41	40.5	27.3	1004.3	1.29	1864	2.6873	2.7694	0.0821	44
13-Jun-18	22738	13988.31	14012.08	1426.20	40	41	40.5	27.8	1006.5	1.29	1846	2.7041	2.7246	0.0205	11
19-Jun-18	22862	14012.08	14035.87	1427.40	38	40	39.0	28.4	1005.9	1.23	1761	2.6783	2.7538	0.0755	43
25-Jun-18	22905	14035.87	14059.88	1440.60	38	40	39.0	28.5	1004.9	1.23	1776	2.6809	2.7448	0.0639	36
30-Jun-18	22609	14054.88	14078.88	1440.00	53	53	53.0	30.4	1004.1	1.77	2545	2.6821	2.7546	0.0725	28

Noise Measurement Results (dB) of NM1

Date	Start Time	1st Leq_{5min}	L10	L90	2nd Leq_{5min}	L10	L90	3nd Leq_{5min}	L10	L90	4th Leq_{5min}	L10	L90	5th Leq_{5min}	L10	L90	6th Leq_{5min}	L10	L90	Leq30min
4-Jun-18	9:19	56.5	62.6	54.2	58.6	62.1	53.1	58.8	64.2	55.3	61.3	65.9	56.7	61.2	65.1	53.8	59.2	66.1	51.3	60
15-Jun-18	11:13	54.9	61.8	51.2	55.6	62.4	52.3	53.6	58.6	50.1	52.3	59.2	50.3	53.4	57.1	51.7	55.8	59.9	51.4	54
20-Jun-18	11:00	61.2	59.5	52.4	59.4	65.1	55.8	62	64	57.2	58.5	60.2	54.4	61.1	65.6	56	56.8	58.8	52.7	60
26-Jun-18	13:00	60.8	64.5	55.5	55.3	56.5	53	55.7	57	54	57.1	59.5	54	60.5	66	54	63.4	67	54.5	60

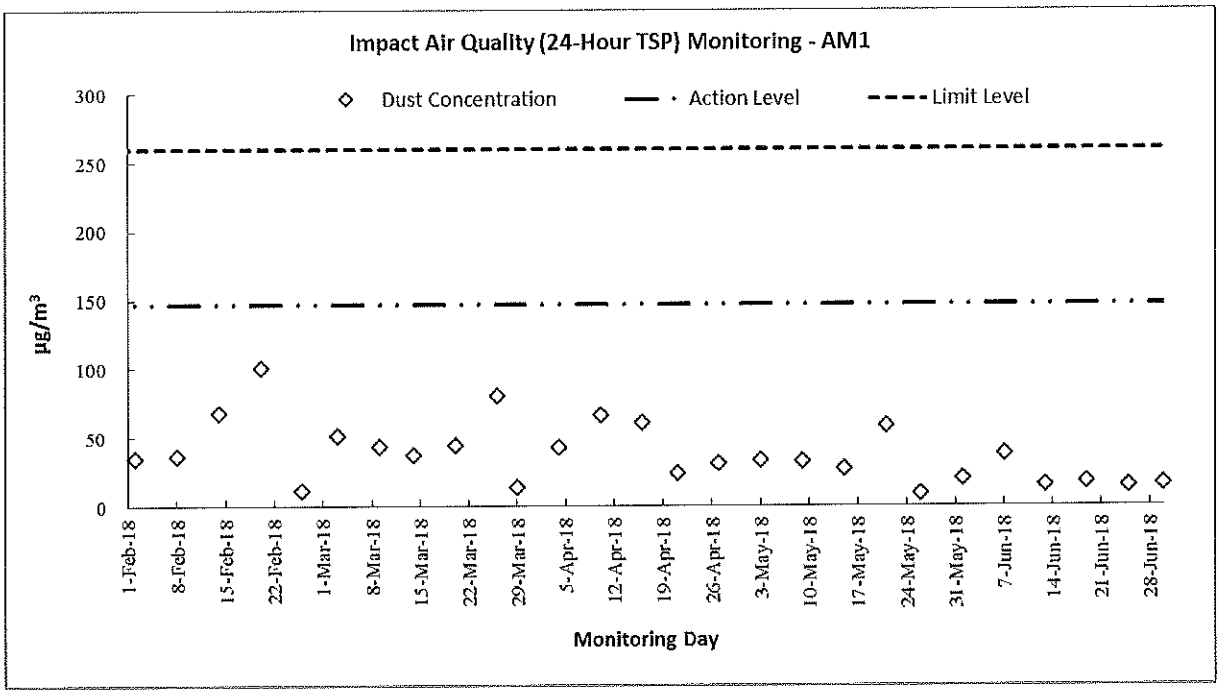
Noise Measurement Results (dB) of NM2

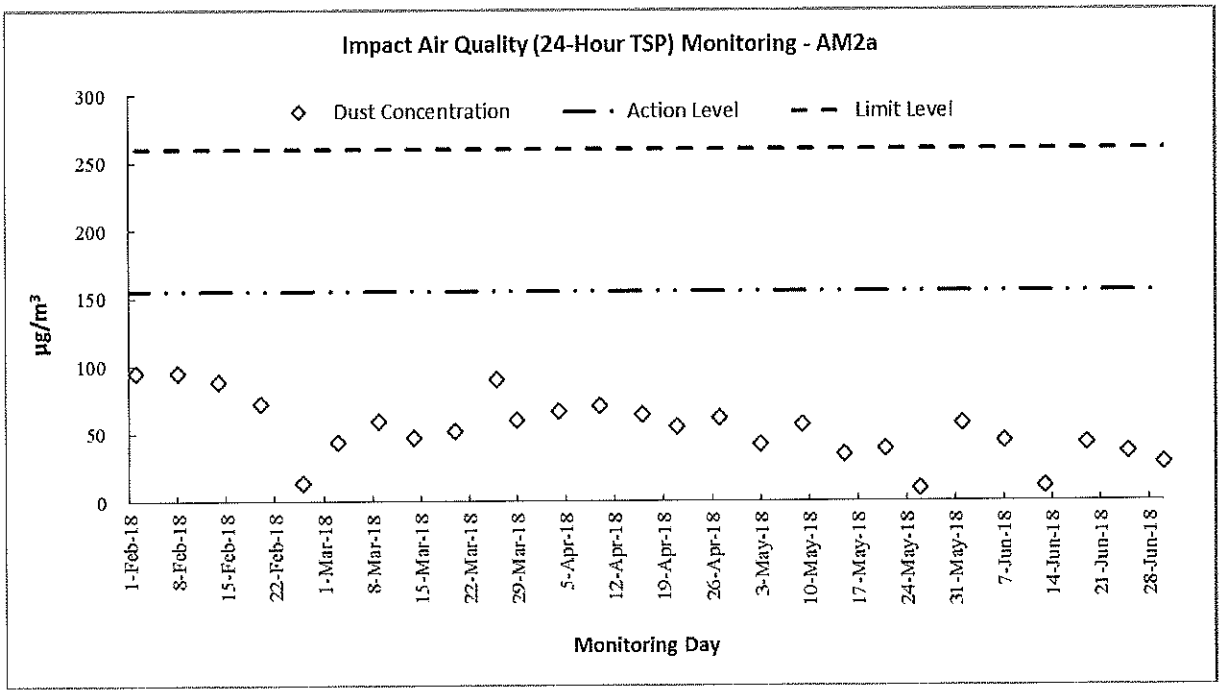
Date	Start Time	1st Leq_{5min}	L10	L90	2nd Leq_{5min}	L10	L90	3nd Leq_{5min}	L10	L90	4th Leq_{5min}	L10	L90	5th Leq_{5min}	L10	L90	6th Leq_{5min}	L10	L90	Leq30min
4-Jun-18	10:33	54.5	59.3	52.1	56.4	62.3	54.2	58.6	61.1	54.3	56.3	59.3	52.9	61.3	65.4	57.3	59.3	64.2	55.9	58
15-Jun-18	10:06	52.8	59.7	49.6	57.4	61.8	55.2	59.2	62.5	54.6	56.3	60.2	51.2	55.4	61.4	52.9	48.9	54.4	47.6	56
20-Jun-18	11:35	60.8	65.1	54.3	67.1	68.8	60.2	62.4	66.2	59.9	55.8	56.9	53.3	57.7	58.2	54.1	60.2	63.1	56.3	62
26-Jun-18	13:40	59.1	62.5	57.5	59.1	61.0	57.5	59.3	60.5	58.0	59.8	60.5	59.0	59.9	60.0	59.0	60.6	61.5	59.0	60

Appendix J

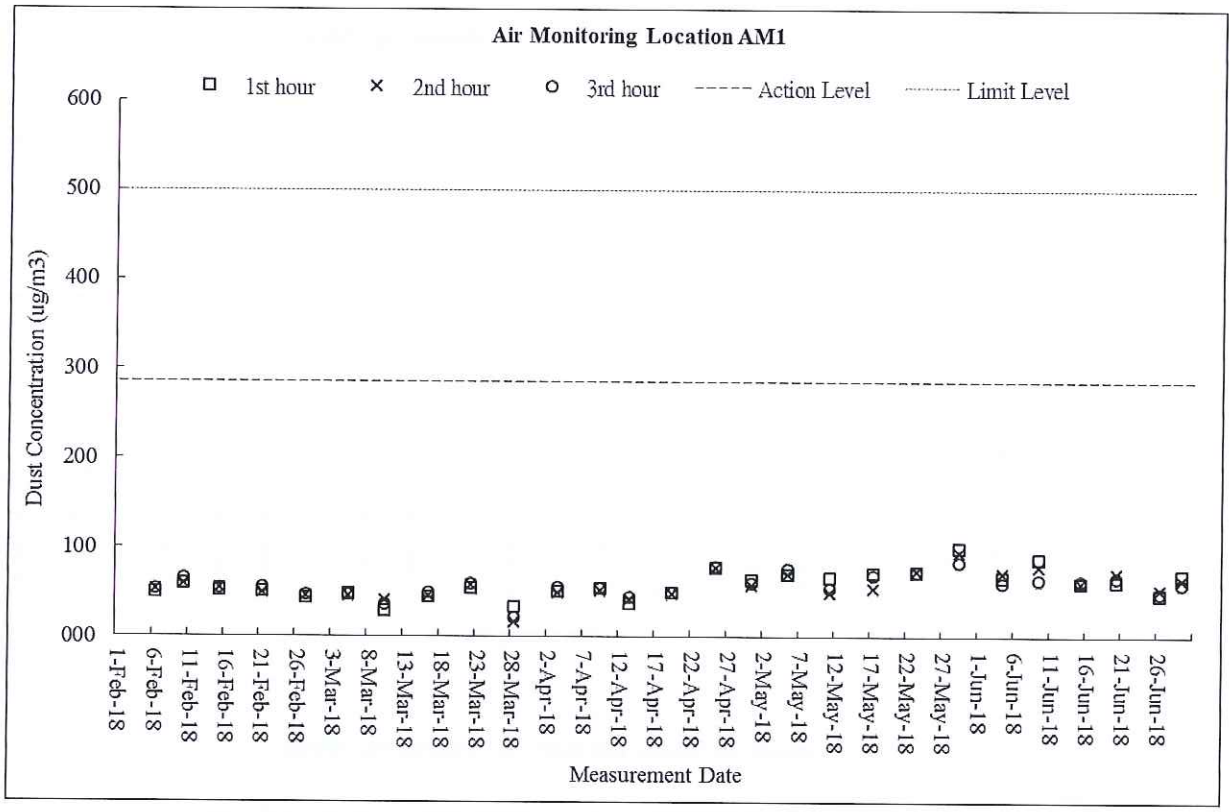
GRAPHICAL PLOTS

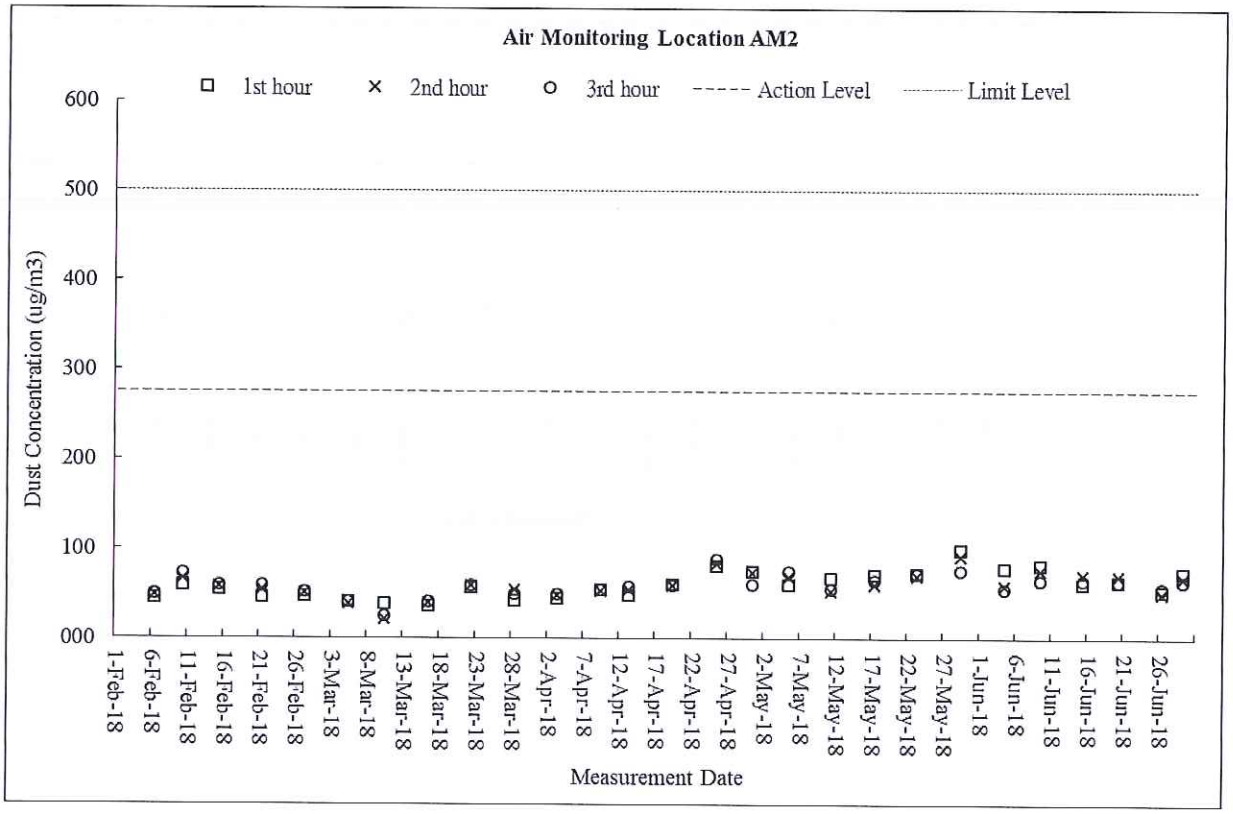
Air Quality – 24-Hour TSP



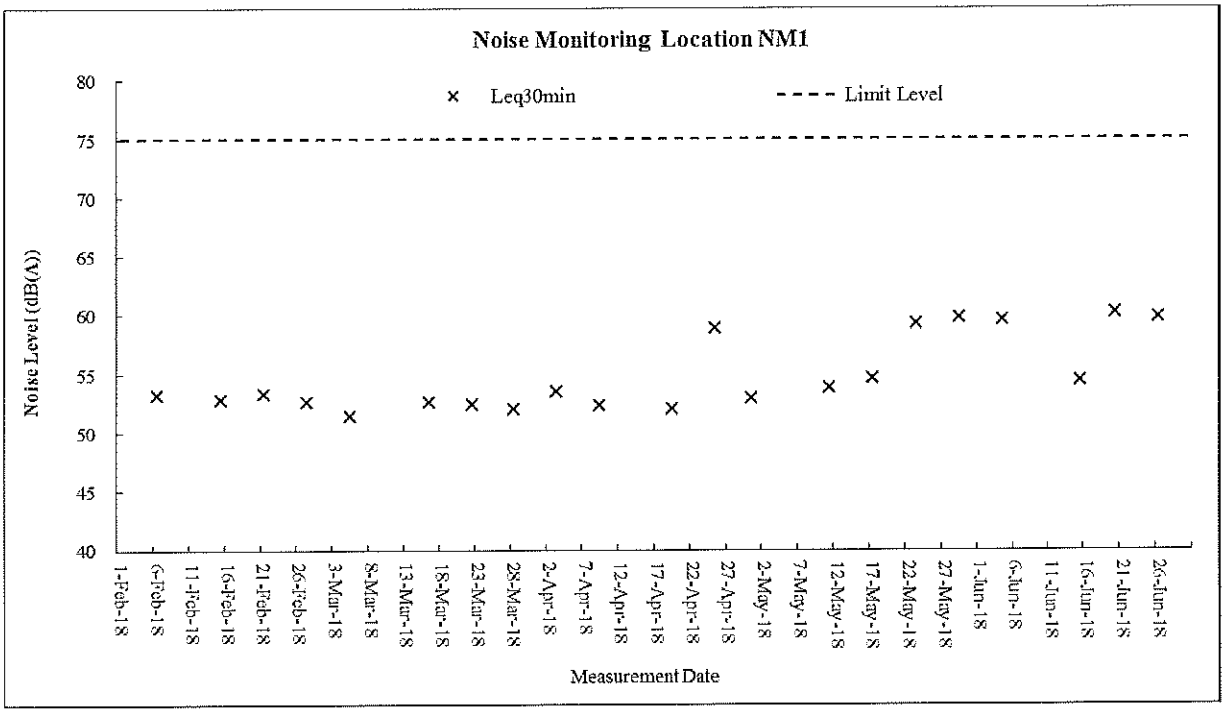


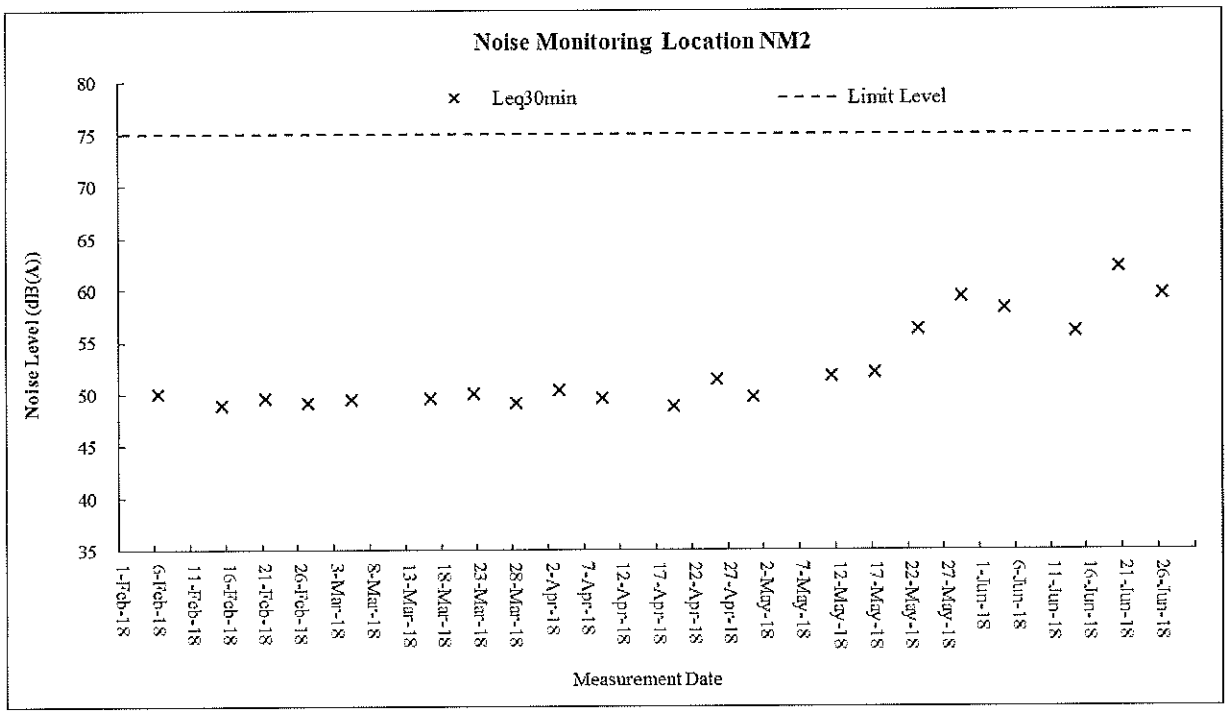
Air Quality – 1-Hour TSP





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-Jun-18	Fri	Fine and very hot. Light to moderate southwesterly winds.	0	31	8.2	70	E/SE
2-Jun-18	Sat	Fine and very hot. Light to moderate southwesterly winds.	Trace	30	7.9	69	E
3-Jun-18	Sun	Mainly cloudy with a few showers and thunderstorms.	Trace	30.2	10.5	66	E
4-Jun-18	Mon	Mainly cloudy with a few showers and thunderstorms.	12.4	30	10.8	72.2	E/NE
5-Jun-18	Tue	Cloudy with squally showers and thunderstorms.	28.2	28.5	9.3	83	E/NE
6-Jun-18	Wed	occasionally strong offshore and on high ground	58.3	27.1	7	92.5	E/NE
7-Jun-18	Thu	Mainly cloudy with a few squally showers and thunderstorms	47.4	27.5	8	85	E/NE
8-Jun-18	Fri	Mainly cloudy with a few squally showers and thunderstorms	70.2	27.2	10.1	86.2	E/SE
9-Jun-18	Sat	Mainly fine. Very hot and dry in the afternoon. Light winds.	4.8	28.4	8.2	73	N/NW
10-Jun-18	Sun	Mainly fine. Very hot and dry in the afternoon. Light winds.	0	29.6	7.3	68.5	N/NW
11-Jun-18	Mon	Mainly fine. Very hot and dry in the afternoon. Light winds.	0	29.3	6	66.2	N/NW
12-Jun-18	Tue	Mainly cloudy with showers and a few thunderstorms.	39.6	27.6	8.3	81.5	E/NE
13-Jun-18	Wed	Cloudy. Heavy showers at first.	109.3	27	7	85.7	E/NE
14-Jun-18	Thu	Mainly cloudy with sunny intervals.	1.3	26.7	5.6	82	N/NW
15-Jun-18	Fri	Mainly cloudy with isolated showers. Sunny periods	0.2	26.8	6.5	77	N/NW
16-Jun-18	Sat	Mainly cloudy with sunny intervals.	0	28.5	7.8	75	N/NW
17-Jun-18	Sun	Mainly cloudy with isolated showers. Sunny periods	Trace	28.7	8.1	72	S/SW
18-Jun-18	Mon	Mainly cloudy with sunny intervals.	Trace	29.2	8	73.7	S/SW
19-Jun-18	Tue	Hot with sunny periods.	Trace	29.5	8.2	79.2	S/SW
20-Jun-18	Wed	Hot with sunny periods.	Trace	29.5	6.5	82	SW
21-Jun-18	Thu	Mainly cloudy with a few showers.	2.6	29.6	6.5	80	S/SW
22-Jun-18	Fri	Mainly cloudy with a few showers.	32.9	27.8	7.5	85	S/SE
23-Jun-18	Sat	Mainly cloudy with a few showers.	25.6	28.4	7.5	84	S/SE
24-Jun-18	Sun	Hot with sunny periods.	18.1	28.8	7.6	81.5	E/SE
25-Jun-18	Mon	Mainly cloudy with occasional showers	6.2	28	10	85.5	E/SE
26-Jun-18	Tue	Sunny periods. It will be hot.	1.7	28.3	6	84	E/SE
27-Jun-18	Wed	Mainly cloudy with a few showers	Trace	28.1	9.7	81.5	E/NE
28-Jun-18	Thu	Mainly fine. Very hot	0	28.6	6.1	74.5	SW
29-Jun-18	Fri	Mainly fine apart from isolated showers	Trace	29.5	7	75.7	W/SW
30-Jun-18	Sat	Mainly fine. Very hot with isolated showers	Trace	29.7	6.8	74.5	W/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	Hard Rock and Large Broken Concrete	Reused in the Contract	Reused in other Projects	Disposed as Public Fill	Imported Fill	Metals	Paper/ cardboard packaging	Plastics (see Note 3)	Chemical Waste	Others, e.g. general refuse
	(in '000m^3)	(in '000m^3)	(in '000m^3)	(in '000m^3)	(in '000m^3)	(in '000m^3)	(in '000 kg)	(in '000kg)	(in '000kg)	(in '000kg)	(in '000m^3)
Jan 15	NIA	NIA	NIA	NIA	NIA	NIA	NIA	NIA	NIA	NIA	NIA
Feb 15	NIA	NIA	NIA	NIA	NIA	NIA	NIA	NIA	NIA	NIA	NIA
Mar 15	NIA	NIA	NIA	NIA	NIA	NIA	NIA	NIA	NIA	NIA	NIA
Apr 15	NIA	NIA	NIA	NIA	NIA	NIA	NIA	NIA	NIA	NIA	NIA
May 15	NIA	NIA	NIA	NIA	NIA	NIA	NIA	NIA	NIA	NIA	NIA
June 15	NIA	NIA	NIA	NIA	NIA	NIA	NIA	NIA	NIA	NIA	NIA
Sub-total	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**
July 15	0.000	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	0.000
Sep 15	0.000	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	0.000	0.014
Nov 15	1.119	0.263	0.001	0.000	0.855	0.273	44.170	0.000	0.000	0.000	0.000
Dec 15	1.300	0.744	0.001	0.000	0.555	6.123	25.550	0.000	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**	**0.000**	**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 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	Hard Rock and Large Broken Concrete	Reused in the Contract	Reused in other Projects	Disposed as Public Fill	Imported Fill	Metals	Paper/ cardboard packaging	Plastics (see Note 3)	Chemical Waste	Others, e.g. general refuse
	(in '000m^3)	(in '000m^3)	(in '000m^3)	(in '000m^3)	(in '000m^3)	(in '000m^3)	(in '000 kg)	(in '000kg)	(in '000kg)	(in '000kg)	(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	0.000
Feb-16	2.377	0.089	0.050	2.228	0.010	0.000	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	0.000	0.007
Apr-16	0.160	0.010	0.050	0.000	0.100	0.000	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	0.000	0.026
Jun-16	2.517	0.024	0.300	0.000	2.193	0.000	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**	**0.000**	**0.076**
Jul-16	3.284	0.000	0.150	0.000	3.134	0.000	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	0.000	0.012
Sep-16	0.529	0.000	0.100	0.000	0.429	0.000	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	0.000	0.013
Nov-16	0.266	0.000	0.100	0.000	0.166	0.000	14.700	0.000	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	0.000	0.019
Total	**12.008**	**0.275**	**1.370**	**2.228**	**8.135**	**0.000**	**19.420**	**0.000**	**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	Hard Rock and Large Broken Concrete	Reused in the Contract	Reused in other Projects	Disposed as Public Fill	Imported Fill	Metals	Paper/ cardboard packaging	Plastics (see Note 3)	Chemical Waste	Others, e.g. general refuse
	(in '000m^3)	(in '000m^3)	(in '000m^3)	(in '000m^3)	(in '000m^3)	(in '000m^3)	(in '000 kg)	(in '000kg)	(in '000kg)	(in '000kg)	(in '000m^3)
Jan-17	0.304	0.089	0.100	0.000	0.115	0.000	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	0.000	0.051
Mar-17	0.326	0.076	0.200	0.000	0.050	0.000	1.190	0.015	0.000	0.000	0.029
Apr-17	1.100	0.000	0.200	0.000	0.900	0.000	0.620	0.000	0.000	0.000	0.029
May-17	0.600	0.000	0.100	0.000	0.500	0.000	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	0.000	0.031
Sub-total	**3.590**	**0.165**	**1.200**	**0.000**	**2.225**	**0.000**	**3.640**	**0.015**	**0.000**	**0.000**	**0.182**
Jul-17	0.344	0.000	0.100	0.000	0.244	0.000	0.000	0.000	0.000	0.000	0.041
Aug-17	0.461	0.011	0.400	0.000	0.050	0.000	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	0.000	0.082
Oct-17	0.515	0.106	0.100	0.000	0.309	0.000	5.060	0.000	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	0.000	0.126
Dec-17	0.234	0.068	0.000	0.000	0.166	0.000	0.370	0.059	0.001	0.000	0.100
Total	**6.077**	**0.428**	**1.800**	**0.000**	**3.848**	**0.000**	**9.070**	**0.074**	**0.001**	**0.000**	**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	Hard Rock and Large Broken Concrete	Reused in the Contract	Reused in other Projects	Disposed as Public Fill	Imported Fill	Metals	Paper/ cardboard packaging	Plastics (see Note 3)	Chemical Waste	Others, e.g. general refuse
	(in '000m^3)	(in '000m^3)	(in '000m^3)	(in '000m^3)	(in '000m^3)	(in '000m^3)	(in '000 kg)	(in '000kg)	(in '000kg)	(in '000kg)	(in '000m^3)
Jan-2018	0.072	0.049	0.000	0.000	0.023	0.000	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	0.000	0.022
Mar-2018	0.190	0.006	0.000	0.000	0.184	0.000	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	0.000	0.041
May-2018	0.293	0.116	0.000	0.000	0.177	0.000	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	0.000	0.073
Sub-total	**1.816**	**0.499**	**0.200**	**0.000**	**1.117**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.236**
July-2018	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Aug-2018	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Sep-2018	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Oct-2018	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Nov-2018	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Dec-2018	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Total	**1.816**	**0.499**	**0.200**	**0.000**	**1.117**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.236**

*March 2018 date 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
Air Quality Impact						
S2.4.1.3	Dust suppression measures stipulated in the Air Pollution Control (Construction Dust) Regulation and good site practices: • 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 hardcores; • 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;	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

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
Air Quality Impact						
	• 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/m² 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: • 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 • 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
Ecological Impact						
	• 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 bunded. 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	Sewage from Workforce • 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	Good Site Practices and Waste Reduction Measures: • 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	Waste Reduction Measures: • 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	Storage, Collection and Transportation of Waste Should any temporary storage or stockpiling of waste is required, recommendations to minimize the impacts include: • 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						
	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.					
S6.2.5.2	C&D Materials from Site Formation • 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	C&D Material from Buildings Demolition and New Building Construction • 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						
	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.					
S6.2.5.4	Chemical Waste • 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 Waste General) Regulation, Code of Practice on the Packaging, Labelling and Storage of Chemical Waste
S6.2.5.5	General Refuse • 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 Waste General) Regulation, Code of Practice on the Packaging, Labelling 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	Good Site Practices • 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	MM4 - Tree Protection & Preservation • 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	MM5 - Tree Transplantation • 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 • 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
June 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

CINOTECH CONSULTANTS LTD
Room 1710, Technology Park,
18 On Lai Street,
Shatin, NT, Hong Kong
Tel: (852) 2151 2083 Fax: (852) 3107 1388
Email: info@cinotech.com.hk

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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 9th 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 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 in Bioreactor No.1 (BR1).
- Mechanical Installation of Diffusers and associated equipment in Bioreactor No.1 (BR1).
- Electrical Installation in 11kV HV Switchroom.
- 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
• 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. • 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 of Diffusers and associated equipment within Bioreactor No.1 (BR1).	• 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.	• 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).
- Mechanical Installation of Diffusers and associated equipment in 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 11kV HV Switchroom.

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 9th monthly EM&A report summarizing the EM&A works conducted for the Project in June 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 7, 14, 21 and 28 June 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 28 June 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**	8.24 *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
• Electrical Installation of 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. • 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 of Diffusers and associated equipment within Bioreactor No.1 (BR1).	• 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.	• 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.

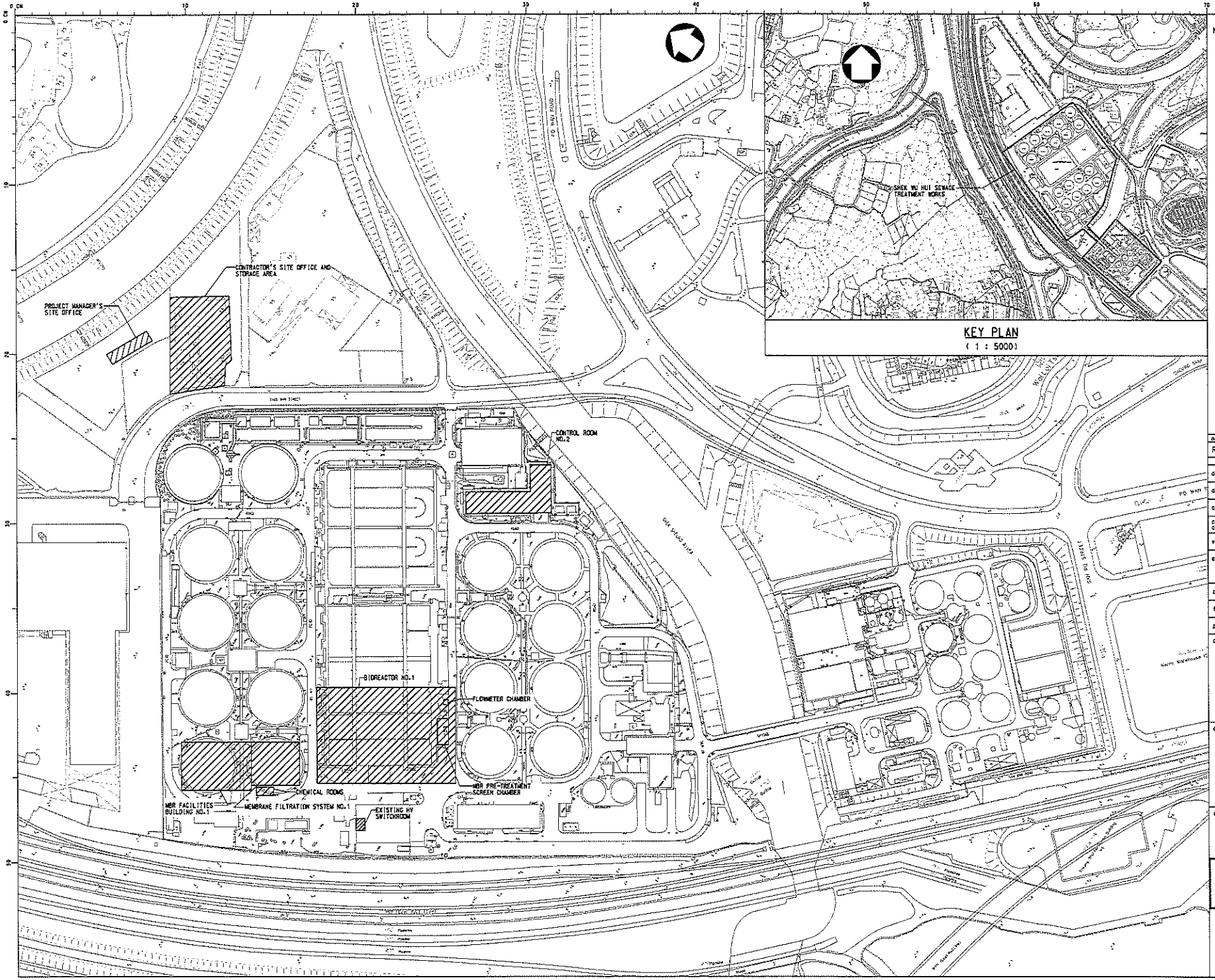
Water Quality

- 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 NO. DEM1619/M01 UNLESS OTHERWISE SPECIFIED.
2. LEGEND REFER TO DRAWING NO. DEM1619/M04.
3. CONTRACT COMPUTER FACILITIES AND FURNITURE FOR PROJECT MANAGER'S SITE OFFICE SHALL BE PROVIDED BY THE E&M CONTRACTOR.

WORKING AREA OF ADVANCE WORKS

no.	date	description	name	initial

REVISION

	name	date
designed	Y Y WONG	22 APR 2015
drawn	C Y CHEUNG	22 APR 2015
checked	C S CHOI	22 APR 2015
counter checked	Y L CHAN	22 APR 2015
vetted	W C FUNG	22 APR 2015
approved	NICKY LI CE/E&MP	23 APR 2015 Date

contract no. DC/2014/01

file no.

project no. 440625 AND 503308

contract

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

drawing title

KEY PLAN AND LOCATION PLAN

drawing no. DEM1619/M02

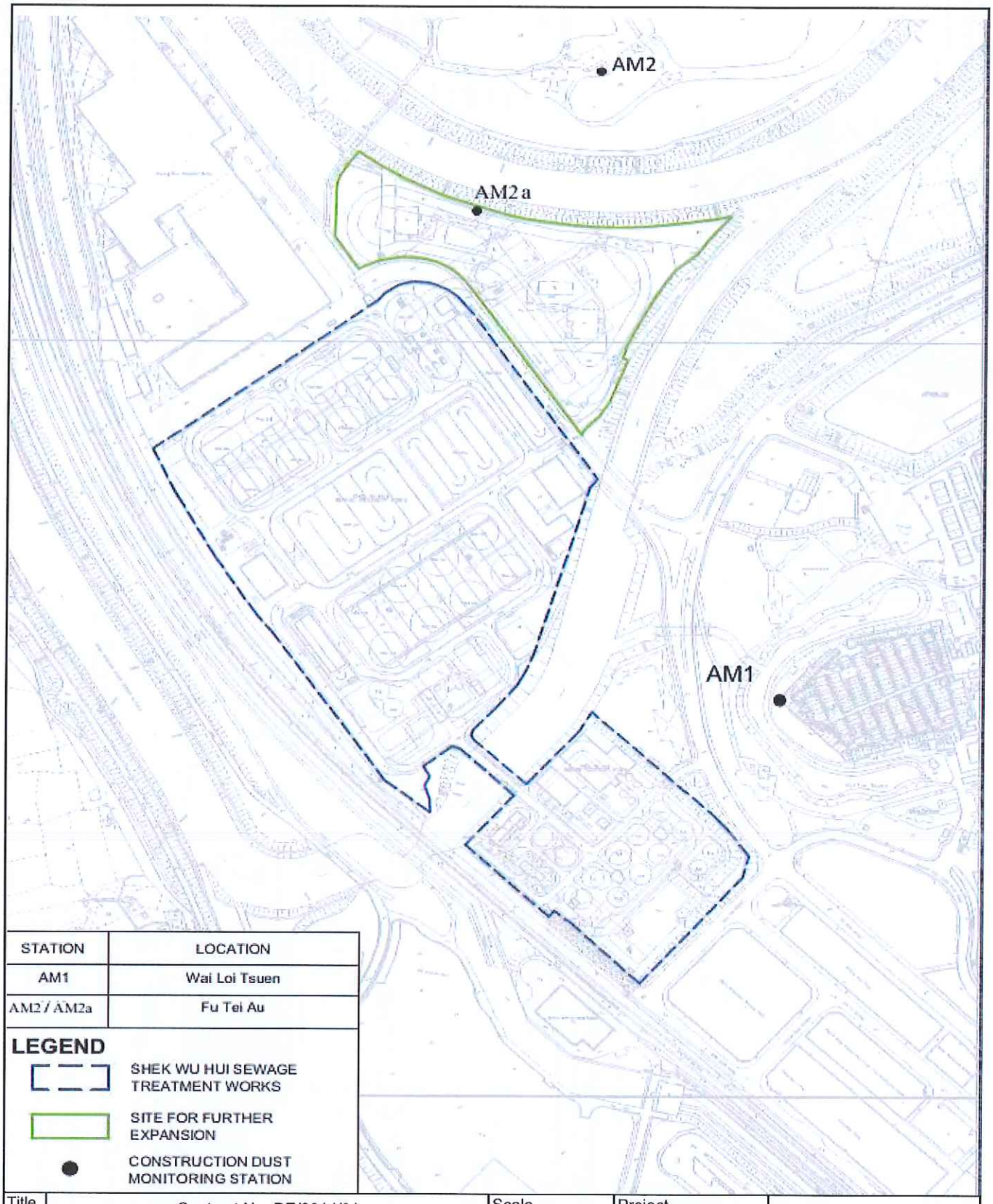
scale 1 : 1000 OR AS SHOWN

office

ELECTRICAL AND MECHANICAL PROJECTS DIVISION

DRAINAGE SERVICES DEPARTMENT
GOVERNMENT OF THE
HONG KONG
SPECIAL ADMINISTRATIVE REGION

A1 PAPER SIZE

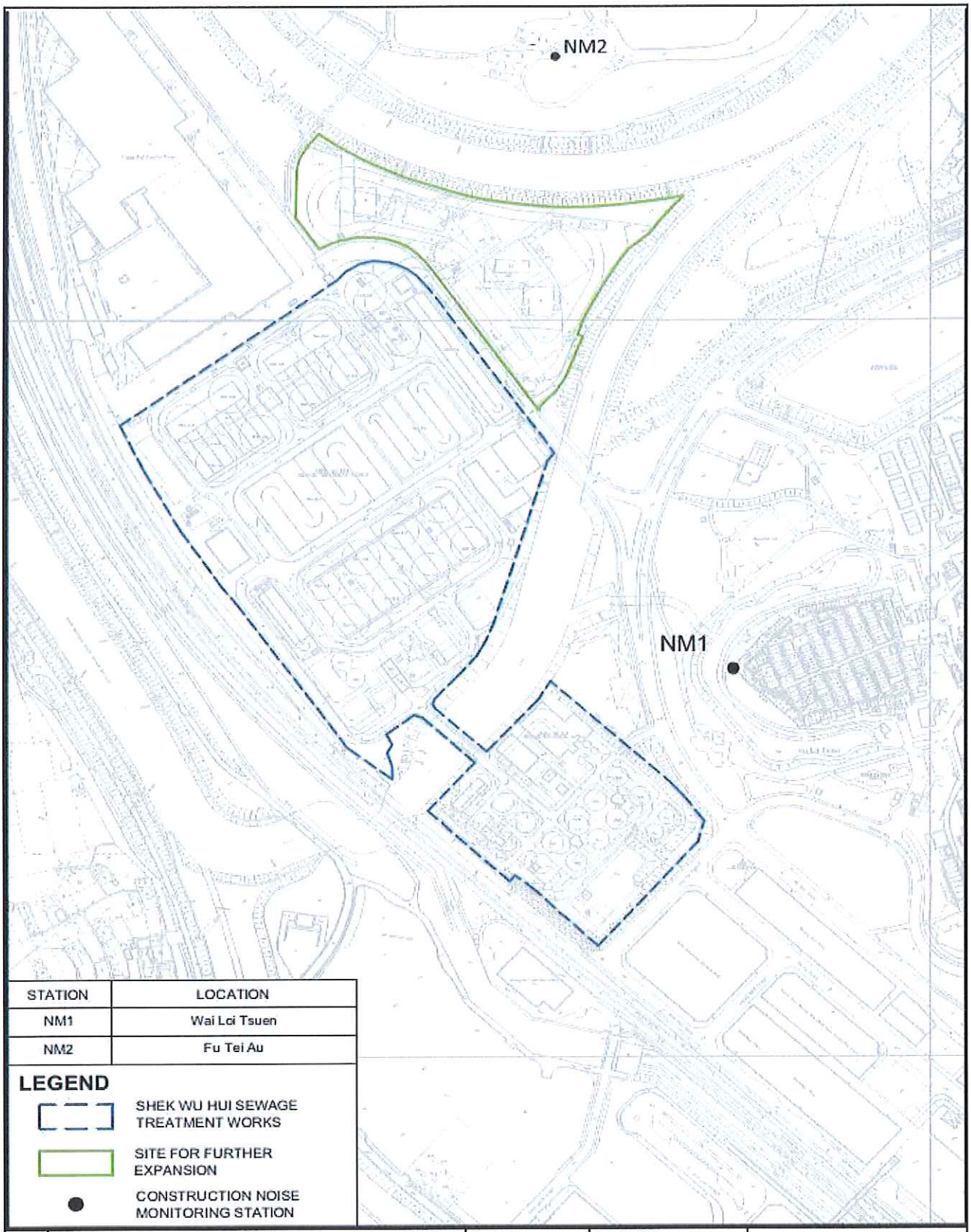


STATION	LOCATION
AM1	Wai Loi Tsuen
AM2 / AM2a	Fu Tei Au

LEGEND

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

Title	Contract No. DE/2014/01 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	Scale N.T.S	Project No. MA16002	CINOTECH
	Locations of Impact Air Quality Monitoring Stations	Date Oct-17	Figures 2	

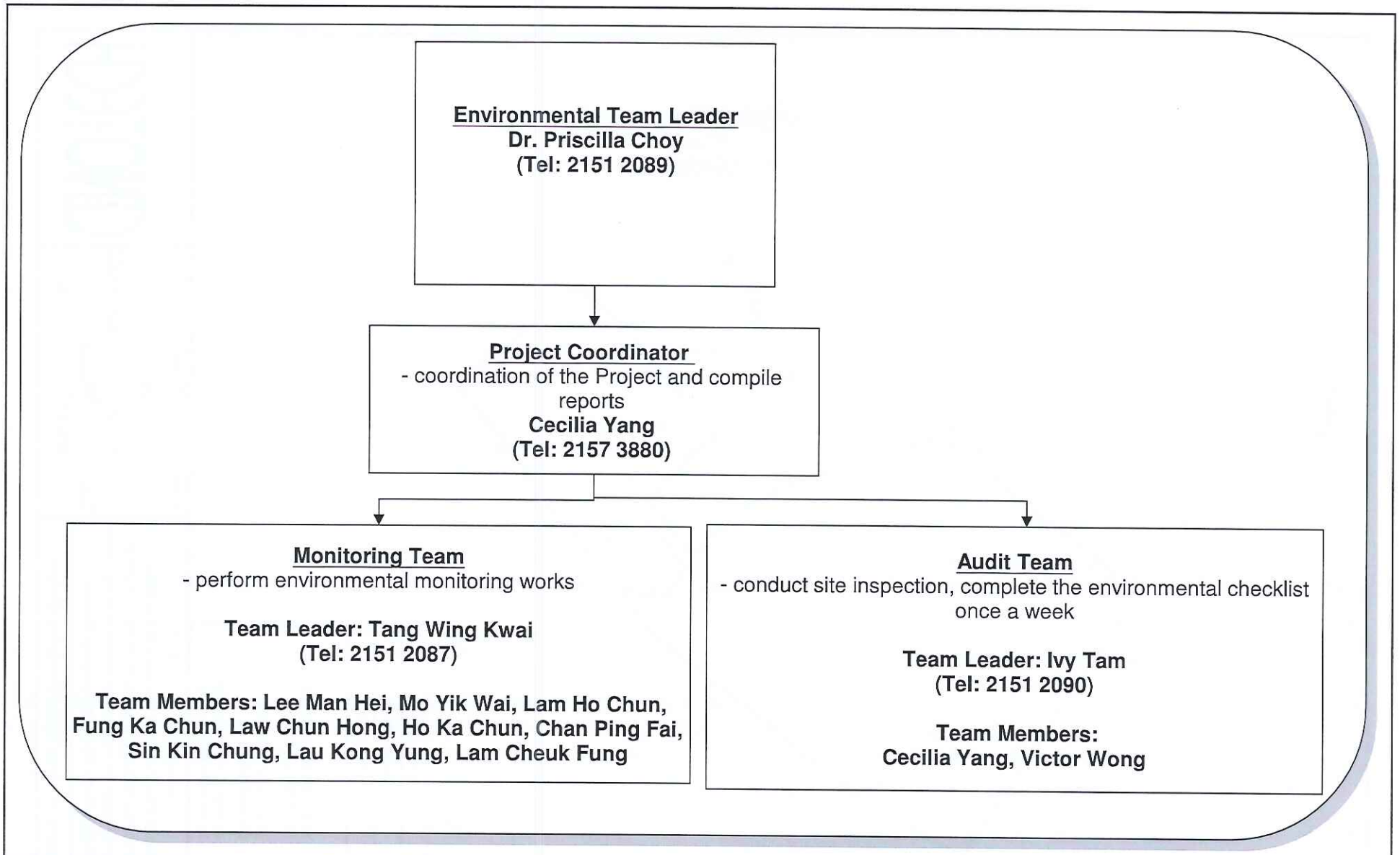


STATION	LOCATION
NM1	Wai Loi Tsuen
NM2	Fu Tei Au

LEGEND

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

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	Scale: N.T.S	Project No.: MA16002	CINOTECH
	Locations of Impact Noise Monitoring Stations	Date: Oct-17	Figures: 3	



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	CINOTECH
		Version: v.1	Figure: 4	

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 ($\mu g/m^3$)		Limit Level ($\mu g/m^3$)	
	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: June 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

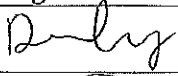
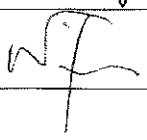
Record Summary of Environmental Site Inspection

Inspection Information

Checklist Reference Number	180607
Date	7 June 2018 (Thursday)
Time	16:00-17:30

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

Ref. No.	Remarks/Observations	Related Item No.
	Part C - Water Quality • No environmental deficiency was identified during the site inspection. *Part D - Air Quality* • No environmental deficiency was identified during the site inspection. *Part E – Construction Noise Impact* • No environmental deficiency was identified during the site inspection. *Part F – Waste / Chemical Management* • No environmental deficiency was identified during the site inspection. *Part G - Permit / Licenses* • No environmental deficiency was identified during the site inspection. *Others / Remarks* • Follow-up on previous audit session (Ref. No.: 180529), no major environmental deficiency was identified by the Contractor.	

	Name	Signature	Date
Recorded by	Donley Fung		7 June 2018
Checked by	Dr. Priscilla Choy		7 June 2018

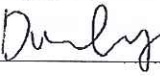
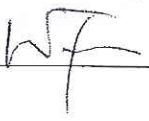
Record Summary of Environmental Site Inspection

Inspection Information

Checklist Reference Number	180614
Date	14 June 2018 (Thursday)
Time	8:45-10:15

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

Ref. No.	Remarks/Observations	Related Item No.
	Part C - Water Quality • No environmental deficiency was identified during the site inspection. *Part D - Air Quality* • No environmental deficiency was identified during the site inspection. *Part E – Construction Noise Impact* • No environmental deficiency was identified during the site inspection. *Part F – Waste / Chemical Management* • No environmental deficiency was identified during the site inspection. *Part G - Permit / Licenses* • No environmental deficiency was identified during the site inspection. *Others / Remarks* • Follow-up on previous audit session (Ref. No.: 180607), no major environmental deficiency was identified by the Contractor.	

	Name	Signature	Date
Recorded by	Donley Fung		14 June 2018
Checked by	Dr. Priscilla Choy		14 June 2018

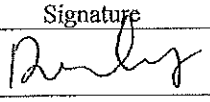
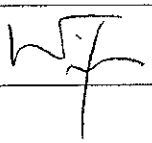
Record Summary of Environmental Site Inspection

Inspection Information

Checklist Reference Number	180621
Date	21 June 2018 (Thursday)
Time	9:30-11:00

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

Ref. No.	Remarks/Observations	Related Item No.
	Part C - Water Quality • No environmental deficiency was identified during the site inspection. *Part D - Air Quality* • No environmental deficiency was identified during the site inspection. *Part E – Construction Noise Impact* • No environmental deficiency was identified during the site inspection. *Part F – Waste / Chemical Management* • No environmental deficiency was identified during the site inspection. *Part G - Permit / Licenses* • No environmental deficiency was identified during the site inspection. *Others / Remarks* • Follow-up on previous audit session (Ref. No.: 180614), no major environmental deficiency was identified by the Contractor.	

	Name	Signature	Date
Recorded by	Donley Fung		21 June 2018
Checked by	Dr. Priscilla Choy		21 June 2018

Record Summary of Environmental Site Inspection

Inspection Information

Checklist Reference Number	180628
Date	28 June 2018 (Thursday)
Time	9:30-11:30

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

Ref. No.	Remarks/Observations	Related Item No.
	Part C - Water Quality • No environmental deficiency was identified during the site inspection. *Part D - Air Quality* • No environmental deficiency was identified during the site inspection. *Part E – Construction Noise Impact* • No environmental deficiency was identified during the site inspection. *Part F – Waste / Chemical Management* • No environmental deficiency was identified during the site inspection. *Part G - Permit / Licenses* • No environmental deficiency was identified during the site inspection. *Others / Remarks* • Follow-up on previous audit session (Ref. No.: 180621), no major environmental deficiency was identified by the Contractor.	

	Name	Signature	Date
Recorded by	Donley Fung	Donley	28 June 2018
Checked by	Dr. Priscilla Choy		28 June 2018

APPENDIX D
SUMMARY OF THE AMOUNT OF WASTE GENERATED

Name of Department: Drainage Services Department Contract No. : DE/2014/01

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	Hard Rock & Large Broken Concrete	Reused in the Contract	Reused in other Projects	Disposed as Public Fill	Imported Fill	Metals	Paper/ cardboard packaging	Plastics (see Note 3)	Chemicals Waste	Others, e.g. general refuse
	(in '000m^3)	(in '000m^3)	(in '000m^3)	(in '000m^3)	(in '000m^3)	(in '000m^3)	(in '000 kg)	(in '000 kg)	(in '000 kg)	(in '000 kg)	(in tonne)
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											
Aug											
Sept											
Oct											
Nov											
Dec											
Total	0	0	0	0	0	0	0	0	0	0	21.71

Forecast of Total Quantities of C&D Materials to be Generated from the Contractor										
Total Quantity Generated	Hard Rock & Large Broken Concrete	Reused in the Contract	Reused in other Projects	Disposed as Public Fill	Imported Fill	Metals	Paper/ cardboard packaging	Plastics (see Note 3)	Chemicals Waste	Others, e.g. general refuse
(in '000 m^3)	(in '000 m^3)	(in '000 m^3)	(in '000 m^3)	(in '000 m^3)	(in '000 m^3)	(in '000 kg)	(in '000 kg)	(in '000 kg)	(in '000 kg)	(in tonne)
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 m^3. (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			
	ET	**IEC**	**ER**	**CONTRACTOR**
ACTION LEVEL				
1. Exceedance for one sample	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.	1. Check monitoring data submitted by ET; 2. Check Contractor's working method.	1. Notify Contractor.	1. Rectify any unacceptable practice; 2. Amend working methods if appropriate.
2. Exceedance for two or more consecutive samples	1. 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	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.	1. Confirm receipt of notification of exceedance writing; 2. Notify Contractor; 3. Ensure remedial measures properly implemented	1. Submit proposals for remedial actions to IEC within three working days of notification; 2. Implement the agreed proposals; 3. Amend proposal if appropriate.

EVENT	ACTION			
	ET	IEC	ER	CONTRACTOR
LIMIT LEVEL				
1. Exceedance for one sample	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.	1. Check monitoring data submitted by ET; 2. Check Contractor's working method; 3. Discuss with ET and Contractor on possible remedial measures; 4. Advise the ER on the effectiveness of the proposed remedial measures; 5. Supervise implementation of remedial measures	1. Confirm receipt of notification of failure in writing; 2. Notify Contractor; 3. Ensure remedial measures properly implemented	1. Take immediate action to avoid further exceedance; 2. 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	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	1. Discuss amongst ER, ET, and Contractor on the potential remedial actions; 2. Review Contractor's remedial actions whenever necessary to assure their effectiveness and advise the ER accordingly; 3. Supervise the implementation of remedial measures.	1. Confirm receipt of notification of 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,	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			
	ET	IEC	ER	CONTRACTOR
	taken; 7. Assess effectiveness of Contractor's remedial actions and keep IEC, EPD and ER informed of the results; 8. If exceedance stops, cease additional monitoring		consider what portion of the work is responsible and instruct the Contractor to stop that portion of work until the exceedance is abated.	the ER until the exceedance is abated

Table E-2 Event / Action Plan For Construction Noise

EVENT	ACTION			
	ET	IEC	ER	CONTRACTOR
Action Level being exceeded	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	1. Review the analysed results submitted by the ET; 2. Review the proposed remedial measures by the Contractor and advise the ER accordingly; 3. Supervise the implementation of remedial measures.	1. Confirm receipt of notification of failure in writing; 2. Notify Contractor; 3. Require Contractor to propose remedial measures for the analysed noise problem; 4. Ensure remedial measures are properly implemented.	1. Submit noise mitigation proposals to IEC; 2. Implement noise mitigation proposals.
Limit Level being exceeded	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.	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.	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.	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	Dust suppression measures stipulated in the Air Pollution Control (Construction Dust) Regulation and good site practices: • 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 hardcores; • 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

	• 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	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/m² 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,
S3.4.1.2	Good Site Practice: • 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

	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.					
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	The following measures to avoid, minimise and mitigate impact on water quality during construction phase shall be implemented • 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

	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; • 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 bunded. 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.					
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 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	Sewage from Workforce • 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	Good Site Practices and Waste Reduction Measures: • 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 Ordinance (WDO)

	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.					
S6.2.3.1	Waste Reduction Measures: • 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	Storage, Collection and Transportation of Waste Should any temporary storage or stockpiling of waste is required, recommendations to minimize the impacts include: • 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	Minimize waste impacts arising from waste storage	Contractor	Work Sites	Construction phase of Advance Works and Main Works of Phase 1A	WDO

	facilities.					
S6.2.5.3	C&D Material from Buildings Demolition and New Building Construction • 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
S6.2.5.4	Chemical Waste • 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 Waste General) Regulation, Code of Practice on the Packaging, Labelling and Storage of Chemical Waste
S6.2.5.5	General Refuse • General refuse should be stored in enclosed bins separately from construction and chemical wastes.	Minimize production of the general refuse and avoid odour, pest	Contractor	Work Sites	Construction phase of Advance Works	Waste Disposal (Chemical Waste General) Regulation,

	• 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

APPENDIX G
COMPLAINT LOG

APPENDIX G – COMPLAINT LOG

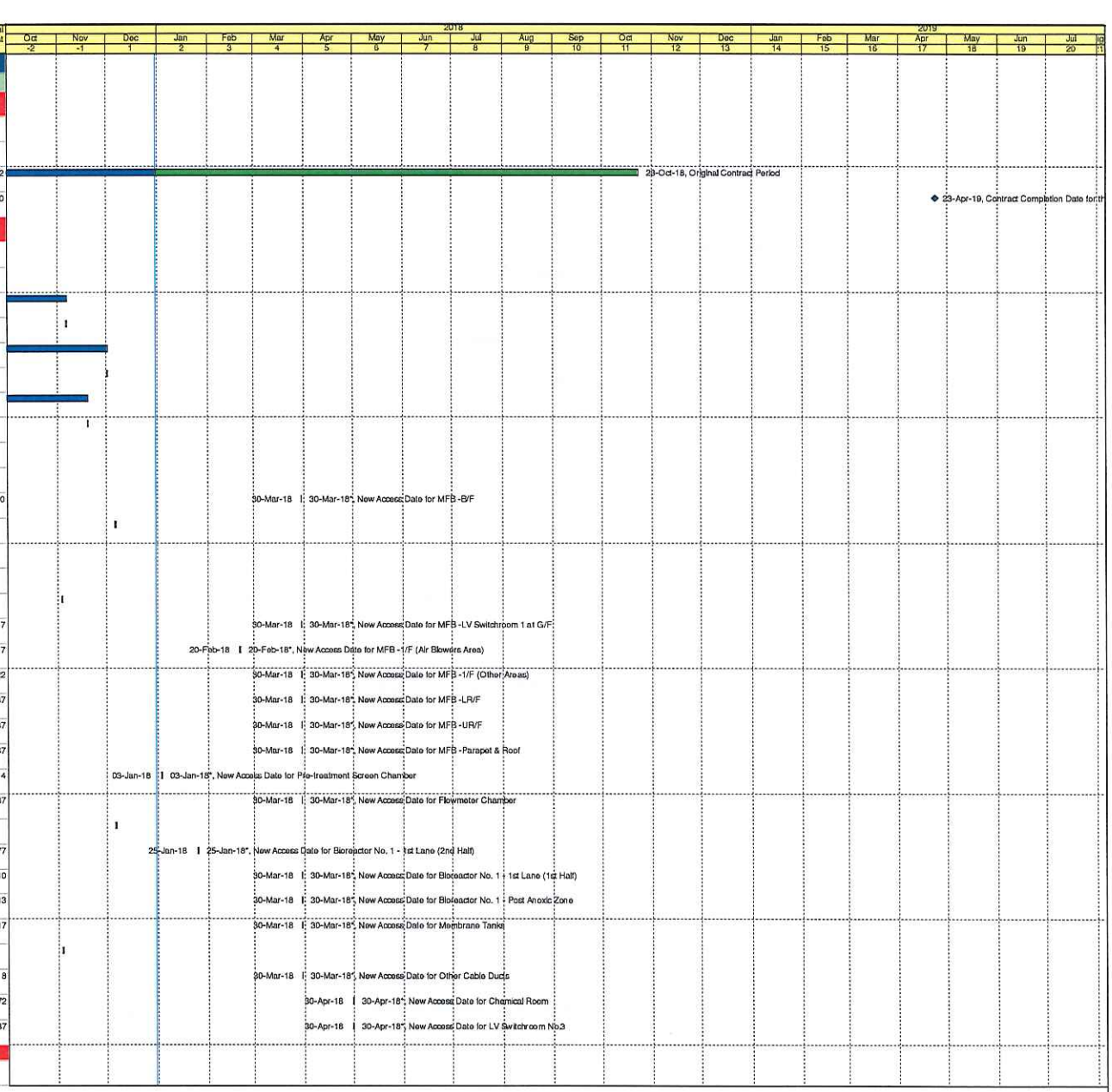
Reporting Month: June 2018

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
Shek Wu Hui STW - Master Programme DE/2014/01					
Contract Data					
Starting Date & Completion Date					
AS000010	Contract Date (LOA)	0	28-Dec-15 A		
AS000020	Contract Starting Date	0	30-Dec-15 A		
AS000110	Original Contract Period	297	30-Dec-15 A	23-Oct-18	182
AS000220	Contract Completion Date for the whole of the Works	0		23-Apr-19	0
Access Date					
AS001010	PM's Site Office and Contractor's Site Office and Storage Area, (within 120 days)	0	30-Dec-15 A	27-Apr-16 A	
AS001012	Planned Access Date for PM's Site Office and Contractor's Site Office and Storage Area	0	27-Apr-16 A	27-Apr-16 A	
AS001020	Flowmeter Chamber, MBR Pre-treatment Screen Chamber and its vicinity, (within 560 days)	0	30-Dec-15 A	06-Nov-17 A	
AS001022	Planned Access Date for Flowmeter Chamber, MBR Pre-treatment Screen Chamber and its vicinity	0	06-Nov-17 A	06-Nov-17 A	
AS001030	Bioreactor no.1 (BR1) and its vicinity, (within 560 days)	0	30-Dec-15 A	01-Dec-17 A	
AS001032	Planned Access Date for Bioreactor no.1 (BR1) and its vicinity	0	01-Dec-17 A	01-Dec-17 A	
AS001040	MBR Facilities Building, Membrane Filtration System No.1 (MFS1) and its vicinity, (within 566 days)	0	30-Dec-15 A	19-Nov-17 A	
AS001042	Planned Access Date for MBR Facilities Building, Membrane Filtration System No.1 (MFS1) and its vicinity	0	19-Nov-17 A	19-Nov-17 A	
AS001050	Ng Chow South Road Sewage Pumping Station - (within 158 days)	0	30-Dec-15 A	04-Jun-16 A	
AS001052	Planned Access Date for Ng Chow South Road Sewage Pumping Station	0	04-Jun-16 A	04-Jun-16 A	
AS001100	New Access Date for MFB -B/F	1	30-Mar-18	30-Mar-18*	0
AS001120	New Access Date for MFB -G/F	0	06-Dec-17 A	06-Dec-17 A	
AS001150	New Access Date for MFB -CLP Rm C	0	29-Sep-17 A	29-Sep-17 A	
AS001160	New Access Date for MFB -CLP Rm D	0	26-Sep-17 A	26-Sep-17 A	
AS001170g	New Access Date for MFB -11kV Switchroom	0	03-Nov-17 A	03-Nov-17 A	
AS001175g	New Access Date for MFB -LV Switchroom 1 at G/F	1	30-Mar-18	30-Mar-18*	17
AS001180	New Access Date for MFB -1/F (Air Blowers Area)	1	20-Feb-18	20-Feb-18*	17
AS001180g	New Access Date for MFB -1/F (Other Areas)	1	30-Mar-18	30-Mar-18*	22
AS001200	New Access Date for MFB -LR/F	1	30-Mar-18	30-Mar-18*	237
AS001220	New Access Date for MFB -UR/F	1	30-Mar-18	30-Mar-18*	237
AS001240	New Access Date for MFB -Parapet & Roof	1	30-Mar-18	30-Mar-18*	237
AS001300	New Access Date for Pre-treatment Screen Chamber	1	03-Jan-18	03-Jan-18*	4
AS001320	New Access Date for Flowmeter Chamber	1	30-Mar-18	30-Mar-18*	87
AS001340	New Access Date for Bioreactor No. 1 - 2nd Lane	0	06-Dec-17 A	06-Dec-17 A	
AS001342	New Access Date for Bioreactor No. 1 - 1st Lane (2nd Half)	1	25-Jan-18	25-Jan-18*	77
AS001342g	New Access Date for Bioreactor No. 1 - 1st Lane (1st Half)	1	30-Mar-18	30-Mar-18*	10
AS001344	New Access Date for Bioreactor No. 1 - Post Anoxic Zone	1	30-Mar-18	30-Mar-18*	13
AS001360	New Access Date for Membrane Tanks	1	30-Mar-18	30-Mar-18*	17
AS001380	Availability of CLP Cable Ducts	0	03-Nov-17 A	03-Nov-17 A	
AS001400	New Access Date for Other Cable Ducts	1	30-Mar-18	30-Mar-18*	8
AS001420	New Access Date for Chemical Room	1	30-Apr-18	30-Apr-18*	72
AS001440	New Access Date for LV Switchroom No.3	1	30-Apr-18	30-Apr-18*	37
Key Dates					
AS002010	Completion of NCSRPSP E&M Works including testing and commissioning	0	30-Dec-15 A	28-Jul-17 A	



JEC

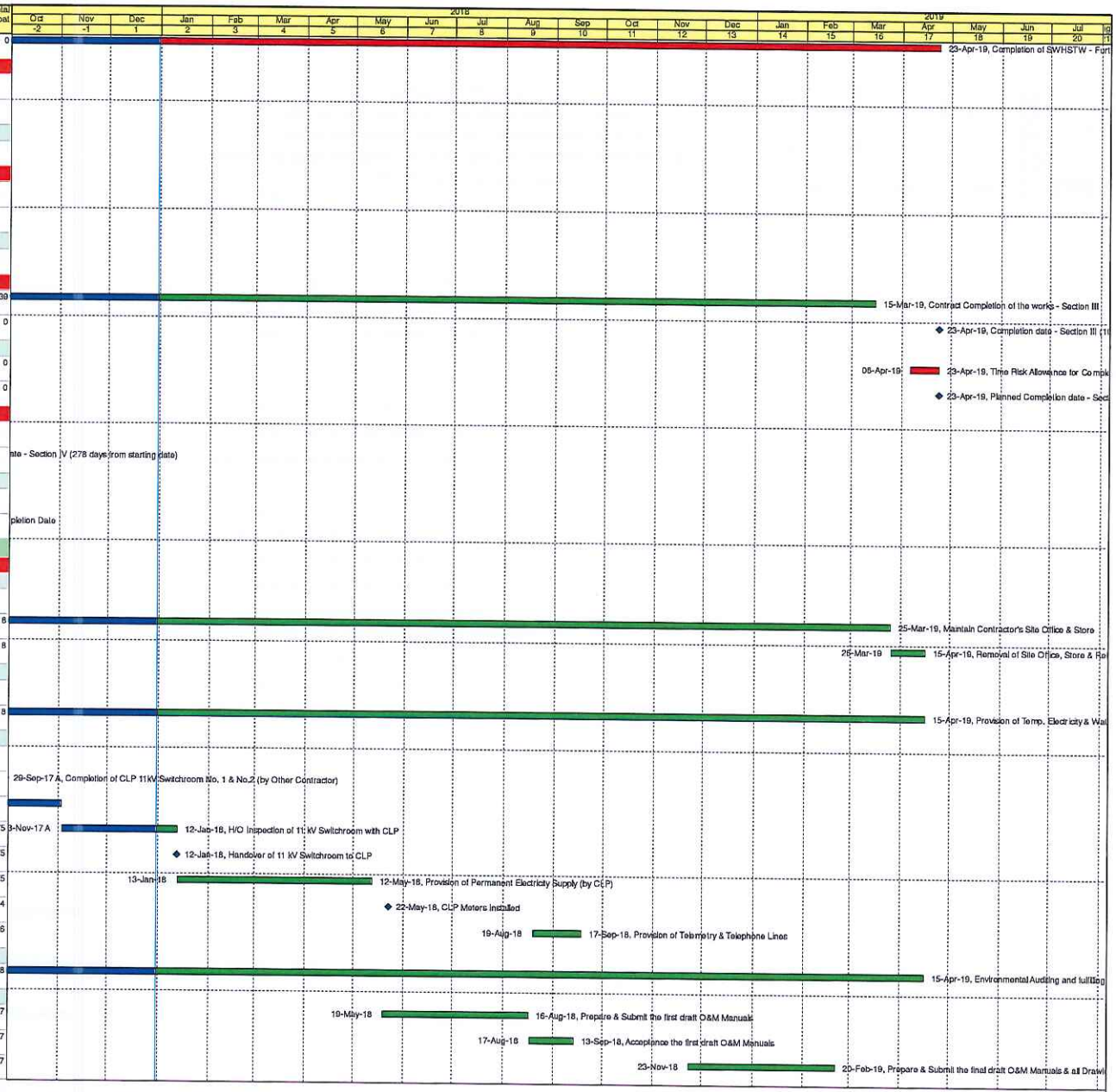
File Name: DE/2014/01G3
Layout: DE1401 (Rev. G) - WBS
TASK filter: All Activities

Remaining Work
Critical Activity
Milestone
Actual Progress

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

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 Duration	Start	Finish	Total Float
AS002020	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					
AS200010	Contract Completion of the works - Section I	0	30-Dec-15 A	23-Sep-16 A	
AS200020	Completion date - Section I (272 days from starting date)	0		23-Sep-16 A	
Time Risk Allowance and Planned Completion					
AS200040	Planned Completion date - Section I	0		23-Sep-16 A	
Section II					
AS300010	Contract Completion of the works - Section II	0	30-Dec-15 A	18-Mar-16 A	
AS300020	Completion date - Section II (80 days from starting date)	0		18-Mar-16 A	
Time Risk Allowance and Planned Completion					
AS300040	Planned Completion date - Section II	0		18-Mar-16 A	
Section III					
AS400010	Contract Completion of the works - Section III	440	30-Dec-15 A	15-Mar-19	39
AS400020	Completion date - Section III (1029 days from starting date)	0		23-Apr-19	0
Time Risk Allowance and Planned Completion					
AS400030	Time Risk Allowance for Completion of Function Test of Section III (4% of installation duration, 463-469 days)	18	06-Apr-19	23-Apr-19	0
AS400040	Planned Completion date - Section III	0		23-Apr-19	0
Section IV					
AS500010	Contract Completion of the works - Section IV	0	30-Dec-15 A	28-Jul-17 A	
AS500020	Completion date - Section IV (278 days from starting date)	0		28-Jul-17 A	
Time Risk Allowance and Planned Completion					
AS500030	Time Risk Allowance for Section IV (4% of installation duration, 120 days)	0	22-Jun-17 A	28-Jul-17 A	
AS500040	Planned Completion Date	0		28-Jul-17 A	
Activity Schedule No.1 - Preliminaries					
1.01 - Preliminaries					
Contractor's Site Office Construction					
AS101010	Construction of Contractor's Site Office & Store	0	22-Jul-16 A	23-Sep-16 A	
AS101012	Maintain Contractor's Site Office & Store	450	27-Oct-16 A	25-Mar-19	8
AS101014	Removal of Site Office, Store & Relevant Facilities	21	26-Mar-19	15-Apr-19	8
Site Facilities					
AS101030	Set up Temp. Electricity Supply, Water Supply	0	18-Aug-16 A	23-Sep-16 A	
AS101032	Provision of Temp. Electricity & Water Supply for execution for the Contract	471	27-Oct-16 A	15-Apr-19	8
Permanent Utilities Services					
AS101040	Applications to the Public Utilities for Provision of Services	0	29-Jan-16 A	23-Sep-16 A	
AS101041	Completion of CLP 11kV Switchroom No. 1 & No.2 (by Other Contractor)	0		29-Sep-17 A	
AS101042	BS Works for CLP 11 kV Switchroom No.1 & No. 2	0	30-Sep-17 A	02-Nov-17 A	
AS101042g	H/O Inspection of 11 kV Switchroom with CLP	13	03-Nov-17 A	12-Jan-18	75
AS101043	Handover of 11 kV Switchroom to CLP	0		12-Jan-18	75
AS101045	Provision of Permanent Electricity Supply (by CLP)	120	13-Jan-18	12-May-18	75
AS101045a	CLP Meters Installed	0		22-May-18	94
AS101046	Provision of Telemetry & Telephone Lines	30	19-Aug-18	17-Sep-18	36
Provide all necessary labour, tools, materials, equipment and supervision					
AS101050	Environmental Auditing and fulfilling the Environmental Permit	471	29-Jan-16 A	15-Apr-19	8
O&M Manuals and As-Built Drawings					
AS101061	Prepare & Submit the first draft O&M Manuals	90	19-May-18	16-Aug-18	87
AS101062	Acceptance the first draft O&M Manuals	28	17-Aug-18	13-Sep-18	87
AS101071	Prepare & Submit the final draft O&M Manuals & all Drawings	90	23-Nov-18	20-Feb-19	17



JEC

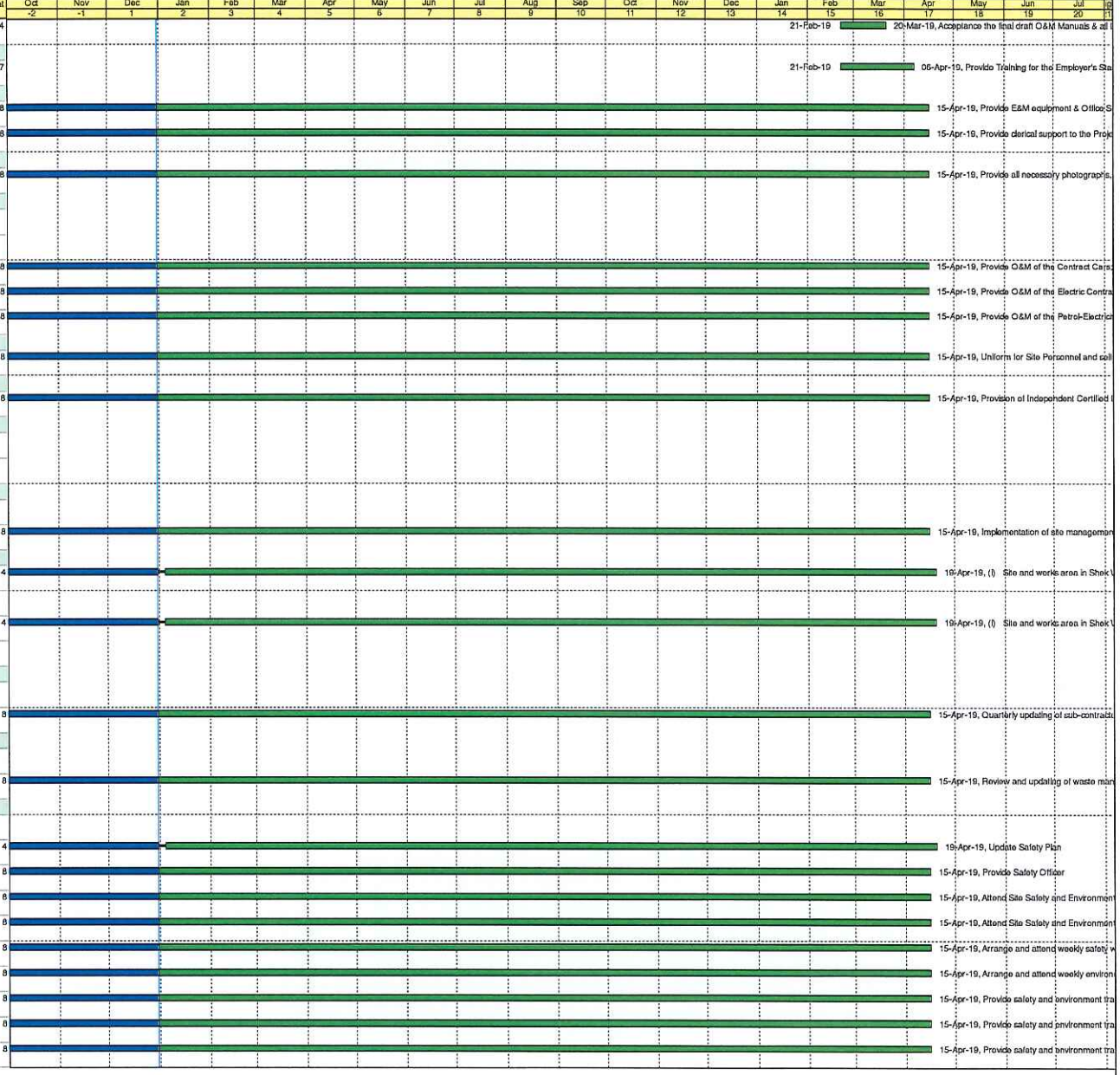
File Name: DE/2014/01G3
Layout: DE1401 (Rev. G) - WBS
TASK filter: All Activities

Remaining Work
Critical Activity
Milestone
Actual Progress

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

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 Duration	Start	Finish	Total Float
AS101072	Acceptance the final draft O&M Manuals & all Drawings	28	21-Feb-19	20-Mar-19	34
Training to Employer's Staff on the O&M of the Plant					
AS101080	Provide Training for the Employer's Staff	45	21-Feb-19	06-Apr-19	17
PM's Site Office					
AS101090	Provide E&M equipment & Office Stationary for the use of Project Manager and Supervisors	471	29-Mar-16 A	15-Apr-19	8
AS101160	Provide clerical support to the Project Manager's site office	471	28-Apr-16 A	15-Apr-19	8
Site Progress					
AS101100	Provide all necessary photographs, video clips and accessories	471	07-Jun-16 A	15-Apr-19	8
Contract Vehicle					
AS101110	Provision of one contract vehicle service (Electric Vehicle) during the normal working hours	0	30-Dec-15 A	28-Jan-16 A	
AS101120	Provide Contract Vehicle Service; one (Petrol-Electricity) & one (Electric) during the normal working hours	0	30-Dec-15 A	28-Jan-16 A	
AS101130	Provide O&M of the Contract Cars; Driving Services; Mobile Phone Services (normal working hours)	471	29-Jan-16 A	15-Apr-19	8
AS101140	Provide O&M of the Electric Contract Cars; Driving Services (outside normal working hours)	471	29-Jan-16 A	15-Apr-19	8
AS101150	Provide O&M of the Petrol-Electricity Contract Cars; Driving Services (outside normal working hours)	471	29-Jan-16 A	15-Apr-19	8
Uniform					
AS101170	Uniform for Site Personnel and self-employed workers	471	29-Jan-16 A	15-Apr-19	8
Independent Checking Engineer					
AS101180	Provision of Independent Certified Engineer in accordance with the Specification	471	29-Jan-16 A	15-Apr-19	8
Automated External Defibrillator (AED)					
AS101190	Provide Automated External Defibrillator (AED) and associated accessories	0	18-Nov-16 A	12-Dec-16 A	
AS101192	Provide Training for Qualified on-site personnels for the use of AED	0	13-Dec-16 A	22-Dec-16 A	
Site Management Plan for Trip Ticket System					
AS102010	Complete site management plan for trip ticket system	0	30-Dec-15 A	13-Mar-16 A	
AS102020	Implementation of site management plan for trip ticket system	471	14-Mar-16 A	15-Apr-19	8
Site Cleaning and Tidiness					
AS103010	(i) Site and works area in Shek Wu Hui Sewage Treatment Works - Daily	471	26-Sep-17 A	19-Apr-19	4
AS103020	(ii) Site and works area in Ng Chow Nam Road Sewage Pumping Station - Daily	0	05-Jun-16 A	27-Sep-16 A	
AS103030	(i) Site and works area in Shek Wu Hui Sewage Treatment Works - Weekly	471	26-Sep-17 A	19-Apr-19	4
AS103040	(ii) Site and works area in Ng Chow Nam Road Sewage Pumping Station - Weekly	0	05-Jun-16 A	27-Sep-16 A	
Subocontractor Management Plan					
AS104010	Complete sub-contractor management plan	0	30-Dec-15 A	27-Feb-16 A	
AS104020	Quarterly updating of sub-contractor management plan	471	29-May-16 A	15-Apr-19	8
Waste Management Plan					
AS105010	Complete waste management plan	0	30-Dec-15 A	28-Mar-16 A	
AS105020	Review and updating of waste management plan	471	29-Mar-16 A	15-Apr-19	8
Safety Scheme					
AS106010	Complete Safety Plan	0	30-Dec-15 A	27-Feb-16 A	
AS106030	Update Safety Plan	471	29-Feb-16 A	19-Apr-19	4
AS106050	Provide Safety Officer	471	28-Apr-16 A	15-Apr-19	8
AS106070	Attend Site Safety and Environment Management Committee	471	28-Apr-16 A	15-Apr-19	8
AS106080	Attend Site Safety and Environment Committee	471	28-Apr-16 A	15-Apr-19	8
AS106090	Arrange and attend weekly safety walk	471	28-Apr-16 A	15-Apr-19	8
AS106100	Arrange and attend weekly environmental walk	471	28-Apr-16 A	15-Apr-19	8
AS106110	Provide safety and environment training - (i) 1 day course (for first attendance)	471	28-Apr-16 A	15-Apr-19	8
AS106120	Provide safety and environment training - (ii) 0.5 day revalidation course	471	28-Apr-16 A	15-Apr-19	8
AS106130	Provide safety and environment training - site specific induction training	471	28-Apr-16 A	15-Apr-19	8



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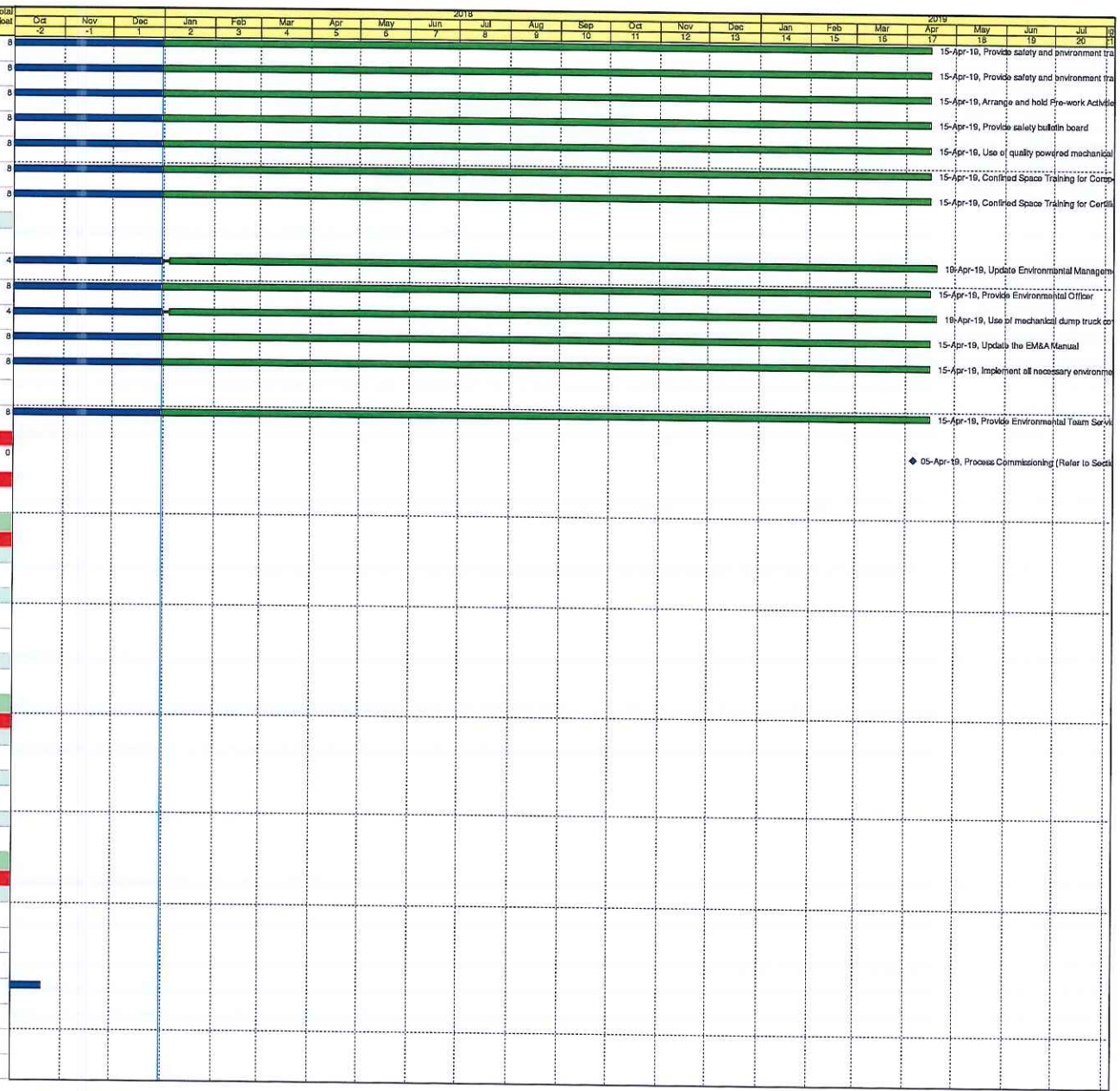
Activity ID	Activity Name	Remaining Duration	Start	Finish	Total Float
AS106140	Provide safety and environment training - toolbox talks	471	28-Apr-16 A	15-Apr-19	8
AS106150	Provide safety and environment training:Participate in safety promotional campaign as instructed by the Engineer	471	28-Apr-16 A	15-Apr-19	8
AS107010	Arrange and hold Pre-work Activities of Site Safety Cycle	471	28-Apr-16 A	15-Apr-19	8
AS107020	Provide safety bulletin board	471	28-Apr-16 A	15-Apr-19	8
AS107030	Use of quality powered mechanical equipment	471	28-Apr-16 A	15-Apr-19	8
AS109010	Confined Space Training for Competent Persons to competent persons	471	28-Apr-16 A	15-Apr-19	8
AS109020	Confined Space Training for Certified Workers to certified workers	471	28-Apr-16 A	15-Apr-19	8
Environmental Scheme					
AS106020	Complete Environmental Management Plan	0	30-Dec-15 A	27-Feb-16 A	
AS106040	Update Environmental Management Plan	471	29-Feb-16 A	19-Apr-19	4
AS106060	Provide Environmental Officer	471	29-Jan-16 A	15-Apr-19	8
AS108010	Use of mechanical dump truck covers	471	29-Feb-16 A	19-Apr-19	4
AS111010	Update the EM&A Manual	471	28-Feb-16 A	15-Apr-19	8
AS111020	Implement all necessary environmental impact mitigation measures	471	28-Feb-16 A	15-Apr-19	8
AS111030	Employ Environmental Team	0	30-Dec-15 A	27-Apr-16 A	
AS111032	Provide Environmental Team Services	471	28-Apr-16 A	15-Apr-19	8
1.12 - Process Commissioning					
AS112000	Process Commissioning (Refer to Section III)	0		05-Apr-19	0
Procurement Procurement Programme					
AS003000	Prepare & Submit Procurement Programme	0	30-Dec-15 A	27-Feb-16 A	
Section I of Works					
Activity Schedule No.2					
1 - Design Calculation of Plant and Materials					
AS201100	Complete Design Calculation of Plant & Material (Refer to P&M Submission Schedule for details)	0	30-Dec-15 A	23-Sep-16 A	
2 - Civil Requirment Drawings for the Plant					
AS202100	Complete Civil Requirment Drawings for Flowmeter Chamber, Pre-treatment Screen, MF Tanks & MFB (B/L)	0	30-Dec-15 A	28-Mar-16 A	
AS202200	Complete Other Civil Requirment Drawings (Refer to Dwgs Submission Schedule for details)	0	30-Dec-15 A	23-Sep-16 A	
3 - Detailed Design and Plant Layout Drawings					
AS203100	Complete Detailed Design and Plant Layout Drawings (Refer to Dwgs Submission Schedule for details)	0	29-Mar-16 A	23-Sep-16 A	
Section II of Works					
Activity Schedule No. 3					
1 - Design Calculation of Plant and Material					
AS301100	Complete Design Calculation of Plant & Material (Refer to P&M Submission Schedule for details)	0	30-Dec-15 A	18-Mar-16 A	
2 - Civil Requirment Drawings for the Plant					
AS302100	Complete Civil Requirment Drawings (Refer to Dwgs Submission Schedule for details)	0	30-Dec-15 A	18-Mar-16 A	
3 - Detailed Design and Plant Layout Drawings					
AS303100	Complete Detailed Design and Plant Layout Drawings (Refer to Dwgs Submission Schedule for details)	0	30-Dec-15 A	18-Mar-16 A	
Section III of Works					
Plant & Material Procurement					
Tender and Award of Suppliers - Mechanical - MBR1					
AS400100	Procurement of BR Feedpumps & Associated Equipment	0	28-May-16 A	23-Sep-16 A	
AS400110	Procurement of MBR Pre-treatment Screen	0	29-Mar-16 A	21-Jun-16 A	
AS400120	Procurement of Wash compactors, bagging system	0	28-May-16 A	25-Aug-16 A	
AS400120a	Procurement of screenings skips	0	30-Sep-16 A	19-Oct-17 A	
AS400130	Procurement of Associated ductworks, pipeworks and valves	0	30-Sep-16 A	20-Sep-17 A	
AS400140	Procurement of Mist system, FRP kiosk and drain pumping system	0	30-Sep-16 A	05-Sep-17 A	
AS400150	Procurement of Ancillary aeration system	0	27-Jun-16 A	22-Sep-16 A	



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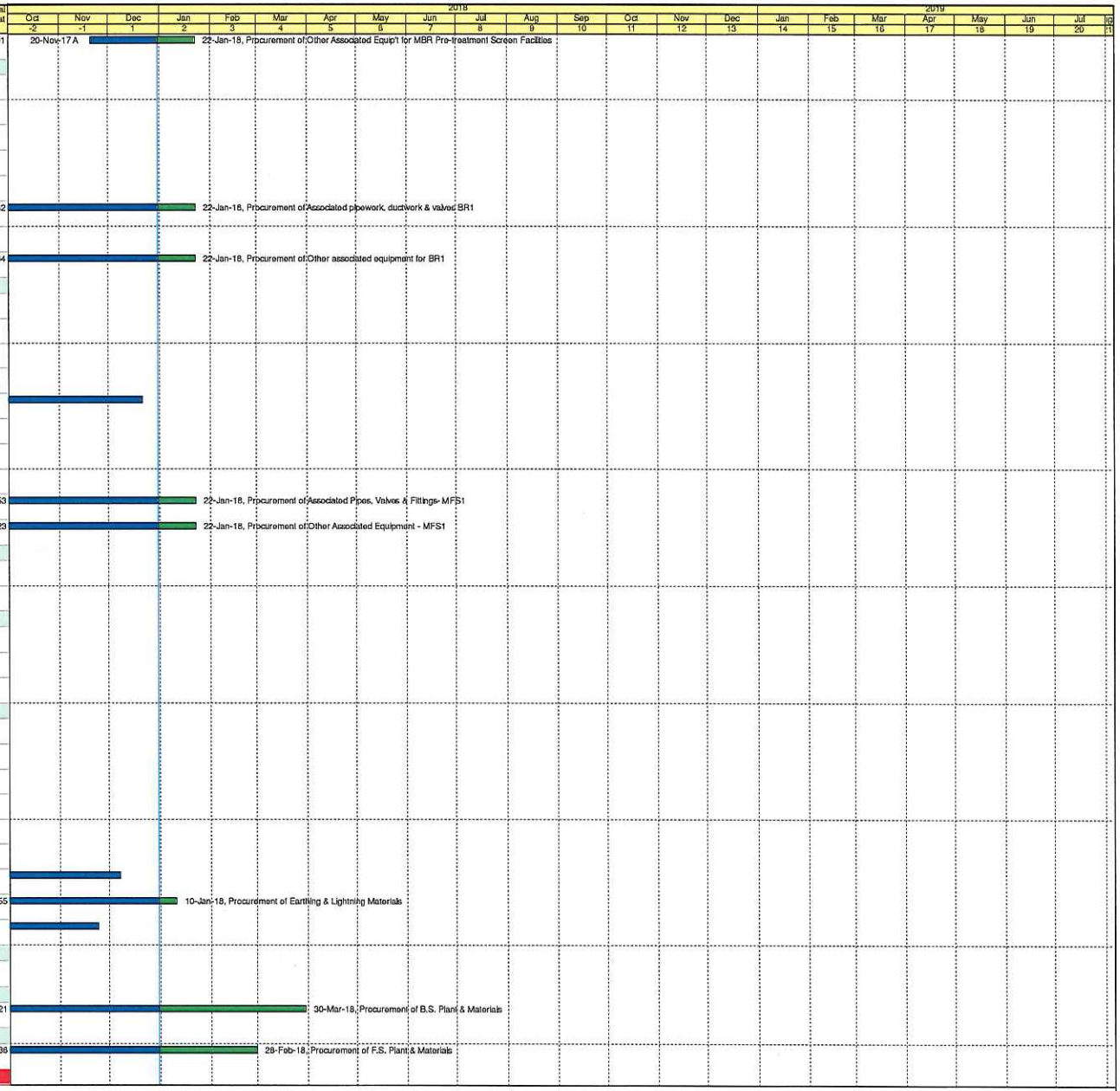
Activity ID	Activity Name	Remaining Duration	Start	Finish	Total Float
AS400160	Procurement of Other Associated Equip't for MBR Pre-treatment Screen Facilities	23	20-Nov-17 A	22-Jan-18	91
Tender and Award of Suppliers - Mechanical - BR1					
AS400200	Procurement of Aeration Blowers	0	27-Jun-16 A	24-Aug-16 A	
AS400210	Procurement of Submersible Mixers	0	28-May-16 A	22-Sep-16 A	
AS400220	Procurement of Mixed Liquor Return pumps	0	28-May-16 A	22-Sep-16 A	
AS400230	Procurement of Surplus Activated Sludge Pumps	0	28-May-16 A	22-Sep-16 A	
AS400240	Procurement of Air Diffusion System	0	29-Mar-16 A	01-Jun-16 A	
AS400250	Procurement of Associated pipework, ductwork & valves BR1	23	30-Sep-16 A	22-Jan-18	62
AS400260	Procurement of Foam control system and wash water spraying system	0	27-Jun-16 A	22-Sep-16 A	
AS400270	Procurement of Other associated equipment for BR1	23	30-Sep-16 A	22-Jan-18	84
Tender and Award of Suppliers - Mechanical - MFS1					
AS400300	Procurement of Membrane Modules - MFS1	0	14-Mar-16 A	29-Apr-16 A	
AS400310	Procurement of Permeate Pumps - MFS1	0	12-Jun-16 A	23-Sep-16 A	
AS400320	Procurement of RAS / Backwash Pumps - MFS1	0	12-Jun-16 A	23-Sep-16 A	
AS400330	Procurement of Air Scouring Blowers - MFS1	0	13-May-16 A	24-Aug-16 A	
AS400340	Procurement of Air Compressor - MFS1	0	14-Mar-16 A	21-Dec-17 A	
AS400350	Procurement of Chemical Dosing System	0	30-Sep-16 A	29-Jun-17 A	
AS400360	Procurement of Permeate Drain Pumps, Drain Pumps for MFS1 & Cleaning drain pumps	0	30-Sep-16 A	05-Sep-17 A	
AS400370	Procurement of Wash Water Pumping System	0	03-Jul-17 A	05-Sep-17 A	
AS400380	Procurement of Associated Pipes, Valves & Fittings- MFS1	23	09-Jan-17 A	22-Jan-18	53
AS400390	Procurement of Other Associated Equipment - MFS1	23	09-Jan-17 A	22-Jan-18	23
Tender and Award of Suppliers - Mechanical - Flowmeter Chamber					
AS400400	Procurement of Flowmeters	0	28-May-16 A	22-Sep-16 A	
AS400410	Procurement of Flange Adaptors & Other Associated Equipment	0	27-Oct-16 A	20-Sep-17 A	
Tender and Award of Suppliers - Penstocks, Lifting Appliance & Deorderisation System					
AS400500	Procurement of Stoplogs	0	30-Sep-16 A	15-Feb-17 A	
AS400510	Procurement of Penstocks	0	30-Sep-16 A	15-Feb-17 A	
AS400520	Procurement of Deodorisers System	0	24-Feb-17 A	26-Jul-17 A	
Tender and Award of Suppliers - Electrical Main & Sub-main					
AS400600	Procurement of 11kV HV Switchboard	0	28-Apr-16 A	21-Sep-16 A	
AS400610	Procurement of 3.3kV HV Switchboard	0	28-Apr-16 A	21-Sep-16 A	
AS400620	Procurement of Transformer	0	28-Apr-16 A	21-Sep-16 A	
AS400630	Procurement of L.V. Switchboard	0	28-Apr-16 A	22-Sep-16 A	
AS400640	Procurement of Variable Speed Drive	0	30-Sep-16 A	02-Mar-17 A	
AS400650	Procurement of Starter for Motor, Screen & Mixer etc.	0	22-Aug-16 A	22-Sep-16 A	
AS400660	Procurement of Power Supply Cables	0	30-Sep-16 A	07-Dec-17 A	
AS400670	Procurement of Earthing & Lightning Materials	11	26-Nov-16 A	10-Jan-18	55
AS400680	Procurement of Cable Tray & Trunking etc.	0	26-Nov-16 A	24-Nov-17 A	
Tender and Award of Suppliers - Monitoring and Control System					
AS400700	Procurement of Monitoring & Control System	0	26-Nov-16 A	18-Jul-17 A	
Tender and Award of Suppliers - Building Services					
AS400720	Procurement of B.S. Plant & Materials	90	26-Nov-16 A	30-Mar-18	21
Tender and Award of Suppliers - Fire Services					
AS400740	Procurement of F.S. Plant & Materials	80	26-Nov-16 A	28-Feb-18	36
Subcontracting Process					



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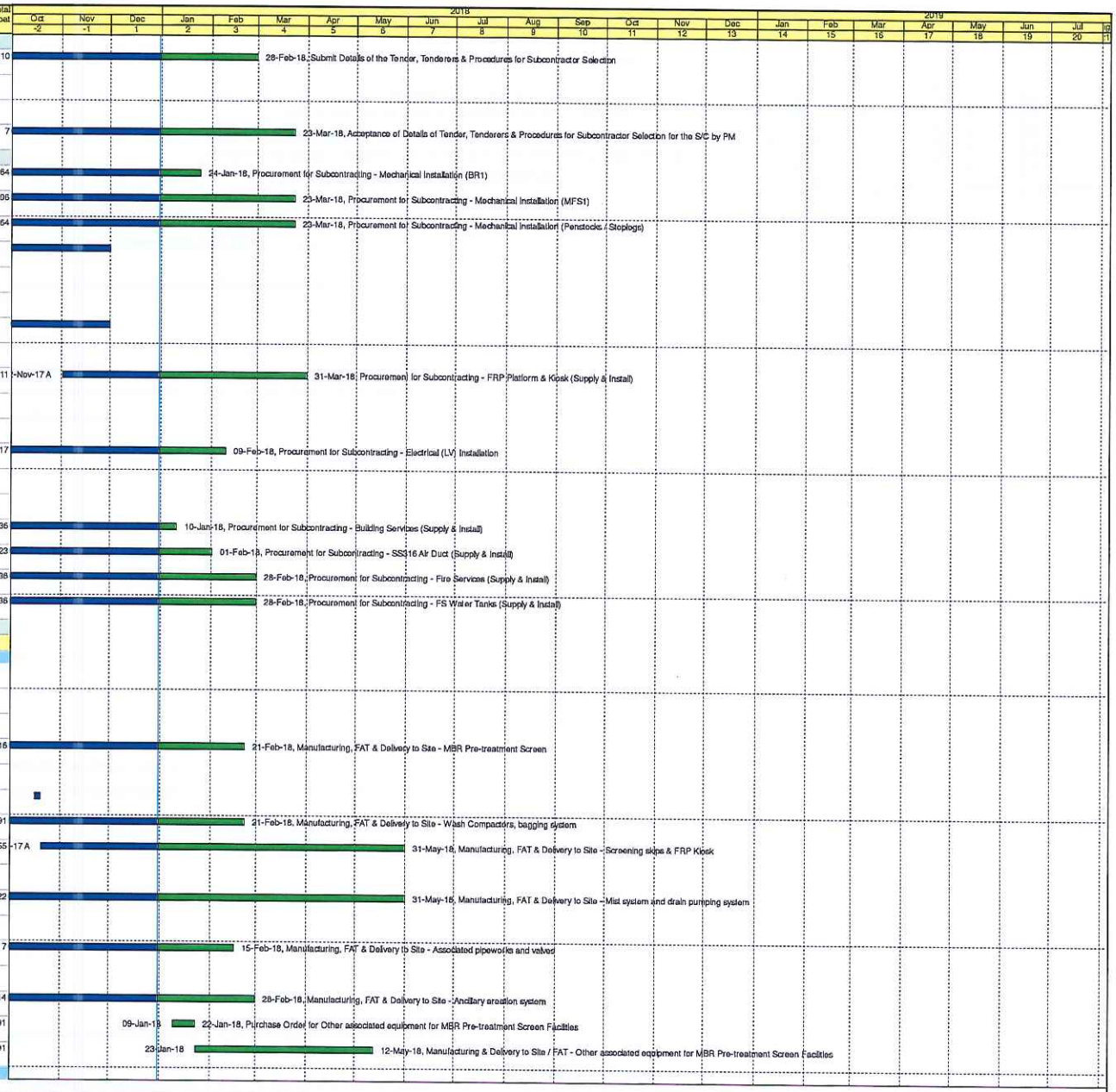
Activity ID	Activity Name	Remaining Duration	Start	Finish	Total Float
Subcontracting Prodedure and Acceptance					
AS400800	Submit Details of the Tender, Tenderers & Procedures for Subcontractor Selection	60	30-Dec-15 A	28-Feb-18	10
AS400810	Comment on Details of the Tender, Tenderers & Procedures for Subcontractor Selection	0	31-Aug-16 A	31-Aug-16 A	
AS400820	Resubmit Details of the Tender, Tenderers & Procedures for Subcontractor Selection	0	31-Aug-16 A	31-Aug-16 A	
AS400830	Acceptance of Details of Tender, Tenderers & Procedures for Subcontractor Selection for the S/C by PM	83	20-Sep-16 A	23-Mar-18	7
Tender and Award of Subontractors					
AS300850	Procurement for Subcontracting - Mechanical Installation (BR1)	25	14-Mar-17 A	24-Jan-18	64
AS300860	Procurement for Subcontracting - Mechanical Installation (MFS1)	83	01-Aug-17 A	23-Mar-18	396
AS300870	Procurement for Subcontracting - Mechanical Installation (Penstocks / Stoplogs)	83	14-Mar-17 A	23-Mar-18	64
AS300880	Procurement for Subcontracting - Mechanical Installation (Flowmeter Chamber)	0	14-Mar-17 A	30-Nov-17 A	
AS300890	Procurement for Subcontracting - Mechanical Installation (DO System -Supply & Install)	0	28-Feb-17 A	28-Jul-17 A	
AS300900	Procurement for Subcontracting - Mechanical Installation (NCSRSPS)	0	25-May-16 A	12-Sep-18 A	
AS400840	Procurement for Subcontracting - Mechanical Installation (MBR Pre-treatment Screen Chamber)	0	21-Mar-17 A	30-Nov-17 A	
AS400910	Procurement for Subcontracting - FRP Cover (Supply & Install)	0	28-Feb-17 A	08-May-17 A	
AS400920	Procurement for Subcontracting - FRP Platform & Kiosk (Supply & Install)	91	02-Nov-17 A	31-Mar-18	11
AS400930	Procurement for Subcontracting - Lifting Appliances (Supply & Install)	0	25-Oct-16 A	19-Jan-17 A	
AS400940	Procurement for Subcontracting - Electrical (HV) Installation	0	20-Oct-16 A	01-Sep-17 A	
AS400950	Procurement for Subcontracting - Electrical (LV) Installation	41	19-Nov-16 A	09-Feb-18	117
AS400960	Procurement for Subcontracting - PCEM System (Supply & Install)	0	08-May-17 A	18-Jul-17 A	
AS400970	Procurement for Subcontracting - SCADA / PLC System (Supply & Install)	0	30-Sep-16 A	18-Jul-17 A	
AS400980	Procurement for Subcontracting - Building Services (Supply & Install)	11	10-Feb-17 A	10-Jan-18	36
AS400982	Procurement for Subcontracting - SS316 Air Duct (Supply & Install)	33	10-Feb-17 A	01-Feb-18	123
AS400990	Procurement for Subcontracting - Fire Services (Supply & Install)	60	10-Feb-17 A	28-Feb-18	38
AS400992	Procurement for Subcontracting - FS Water Tanks (Supply & Install)	60	10-Feb-17 A	28-Feb-18	38
Activity Schedule No. 4					
4.1 Works for MBR Pre-treatment Screen Chamber					
Manufacturing, FAT and Delivery					
AS401010	Purchase Order for BR Feedpumps & Associated Equipment	0	06-Sep-16 A	23-Sep-16 A	
AS401012	Manufacturing, FAT & Delivery to Site - BR Feedpumps & Associated Equipment	0	14-Oct-16 A	18-Jul-17 A	
AS401030	Purchase Order for MBR Pre-treatment Screen	0	01-Jun-16 A	21-Jun-16 A	
AS401032	Manufacturing, FAT & Delivery to Site - MBR Pre-treatment Screen	53	06-Jul-16 A	21-Feb-18	16
AS401050	Purchase Order for Wash Compactors, bagging system	0	23-May-16 A	21-Jun-16 A	
AS401050a	Purchase Order for Screening skips & FRP Kiosk	0	16-Oct-17 A	19-Oct-17 A	
AS401052	Manufacturing, FAT & Delivery to Site - Wash Compactors, bagging system	53	31-Aug-16 A	21-Feb-18	91
AS401052a	Manufacturing, FAT & Delivery to Site - Screening skips & FRP Kiosk	152	20-Oct-17 A	31-May-18	55
AS401070	Purchase Order for Mist system and drain pumping system	0	14-Aug-17 A	05-Sep-17 A	
AS401072	Manufacturing, FAT & Delivery to Site - Mist system and drain pumping system	152	06-Sep-17 A	31-May-18	22
AS401090	Purchase Order for Associated pipeworks and valves	0	18-Sep-17 A	20-Sep-17 A	
AS401092	Manufacturing, FAT & Delivery to Site - Associated pipeworks and valves	47	21-Sep-17 A	15-Feb-18	7
AS401110	Purchase Order for Ancillary areation system	0	13-Sep-16 A	22-Sep-16 A	
AS401112	Manufacturing, FAT & Delivery to Site - Ancillary areation system	60	05-May-17 A	28-Feb-18	114
AS401130	Purchase Order for Other associated equipment for MBR Pre-treatment Screen Facilities	14	09-Jan-18	22-Jan-18	91
AS401132	Manufacturing & Delivery to Site / FAT - Other associated equipment for MBR Pre-treatment Screen Facilities	110	23-Jan-18	12-May-18	91
Install, T&C for Pre-treatment Screen Chamber (incl. Provision for Health & Safety Requirements)					



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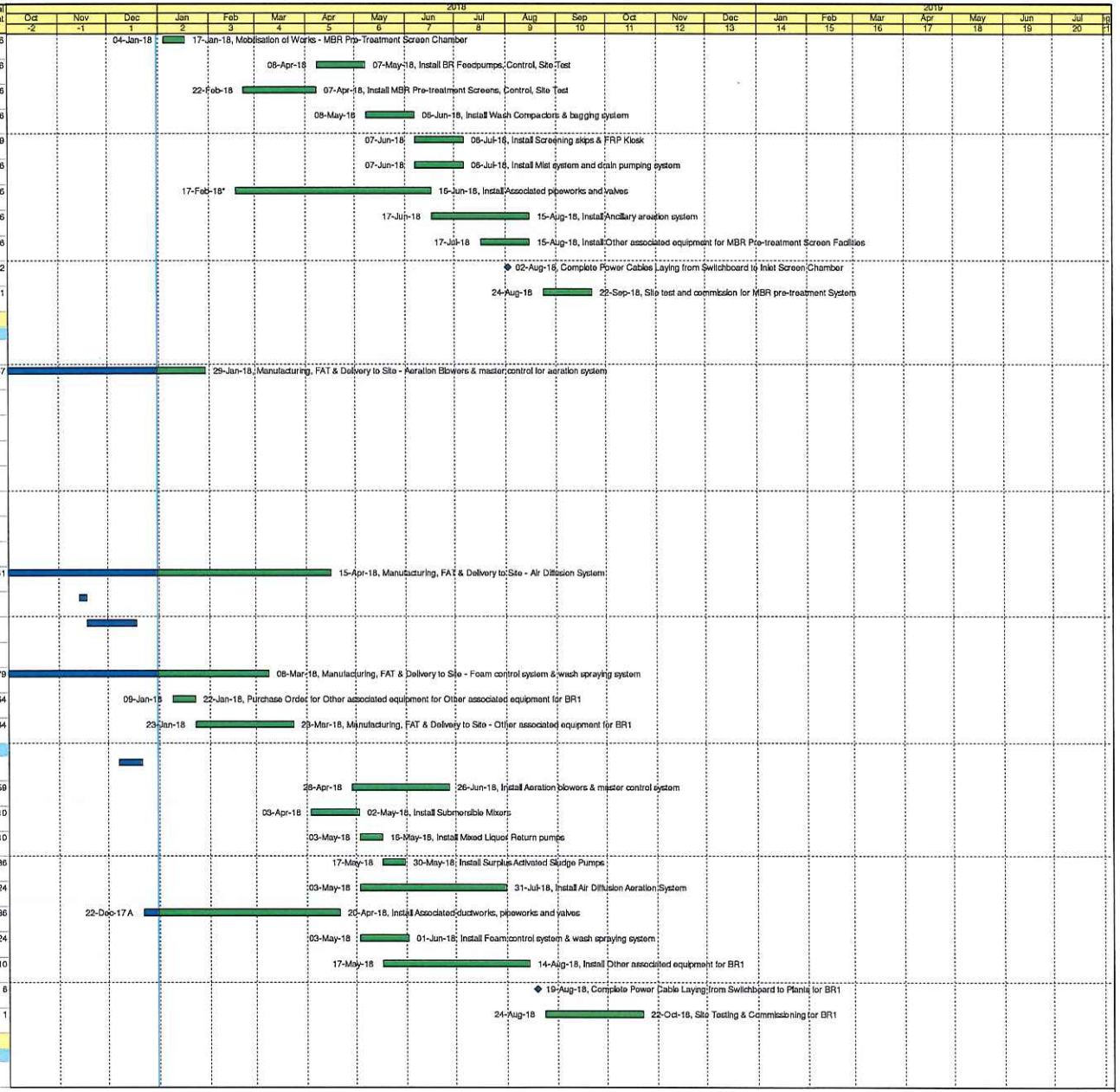
Activity ID	Activity Name	Remaining Duration	Start	Finish	Total Float
AS401002	Mobilisation of Works - MBR Pre-Treatment Screen Chamber	14	04-Jan-18	17-Jan-18	36
AS401020	Install BR Feedpumps, Control, Site Test	30	08-Apr-18	07-May-18	16
AS401040	Install MBR Pre-treatment Screens, Control, Site Test	45	22-Feb-18	07-Apr-18	16
AS401060	Install Wash Compactors & bagging system	30	08-May-18	06-Jun-18	16
AS401060a	Install Screening skips & FRP Kiosk	30	07-Jun-18	06-Jul-18	49
AS401080	Install Mist system and drain pumping system	30	07-Jun-18	06-Jul-18	16
AS401100	Install Associated pipeworks and valves	120	17-Feb-18*	16-Jun-18	6
AS401120	Install Ancillary aeration system	60	17-Jun-18	15-Aug-18	6
AS401140	Install Other associated equipment for MBR Pre-treatment Screen Facilities	30	17-Jul-18	15-Aug-18	6
AS401800	Complete Power Cables Laying from Switchboard to Inlet Screen Chamber	0		02-Aug-18	22
AS401900	Site test and commission for MBR pre-treatment System	30	24-Aug-18	22-Sep-18	1
4.2 Works for Bioreactor No. 1 (BR1)					
Manufacturing, FAT and Delivery					
AS402010	Purchase Order for Aeration Blowers & master control for aeration system	0	18-Aug-16 A	24-Aug-16 A	
AS402012	Manufacturing, FAT & Delivery to Site - Aeration Blowers & master control for aeration system	30	04-Jul-16 A	29-Jan-18	147
AS402030	Purchase Order for Submersible Mixers	0	06-Sep-16 A	22-Sep-16 A	
AS402032	Manufacturing, FAT & Delivery to Site - Submersible Mixers	0	14-Oct-16 A	22-Sep-17 A	
AS402050	Purchase Order for Mixed Liquor Return pumps	0	06-Sep-16 A	22-Sep-16 A	
AS402052	Manufacturing, FAT & Delivery to Site - Mixed Liquor Return pumps	0	14-Oct-16 A	06-Jul-17 A	
AS402070	Purchase Order for Surplus Activated Sludge Pumps	0	06-Sep-16 A	23-Sep-16 A	
AS402072	Manufacturing, FAT & Delivery to Site - Surplus Activated Sludge Pumps	0	14-Oct-16 A	26-Sep-17 A	
AS402090	Purchase Order for Air Diffusion System	0	02-May-16 A	01-Jun-16 A	
AS402092	Manufacturing, FAT & Delivery to Site - Air Diffusion System	106	31-Mar-17 A	15-Apr-18	41
AS402110	Purchase Order for Associated ductworks, pipeworks and valves	0	13-Nov-17 A	17-Nov-17 A	
AS402112	Manufacturing, FAT & Delivery to Site - Associated ductworks, pipeworks and valves	0	18-Nov-17 A	18-Dec-17 A	
AS402130	Purchase Order for Foam control system & wash spraying system	0	13-Sep-16 A	22-Sep-16 A	
AS402132	Manufacturing, FAT & Delivery to Site - Foam control system & wash spraying system	68	14-Oct-16 A	08-Mar-18	79
AS402150	Purchase Order for Other associated equipment for Other associated equipment for BR1	14	09-Jan-18	22-Jan-18	64
AS402152	Manufacturing, FAT & Delivery to Site - Other associated equipment for BR1	60	23-Jan-18	23-Mar-18	64
Install, T&C for BR1 (incl. Provision for Health & Safety Requirements)					
AS402002	Mobilisation of Works - BR1	0	07-Dec-17 A	21-Dec-17 A	
AS402020	Install Aeration blowers & master control system	60	28-Apr-18	26-Jun-18	59
AS402040	Install Submersible Mixers	30	03-Apr-18	02-May-18	10
AS402060	Install Mixed Liquor Return pumps	14	03-May-18	16-May-18	10
AS402080	Install Surplus Activated Sludge Pumps	14	17-May-18	30-May-18	86
AS402100	Install Air Diffusion Aeration System	90	03-May-18	31-Jul-18	24
AS402120	Install Associated ductworks, pipeworks and valves	111	22-Dec-17 A	20-Apr-18	36
AS402140	Install Foam control system & wash spraying system	30	03-May-18	01-Jun-18	24
AS402160	Install Other associated equipment for BR1	90	17-May-18	14-Aug-18	10
AS402800	Complete Power Cable Laying from Switchboard to Plants for BR1	0		19-Aug-18	6
AS402900	Site Testing & Commissioning for BR1	60	24-Aug-18	22-Oct-18	1
4.3 Works for Membrane Filtration System (MFS1)					
Manufacturing, FAT and Delivery					
AS403010	Purchase Order for Membrane Modules	0	18-Apr-16 A	29-Apr-16 A	



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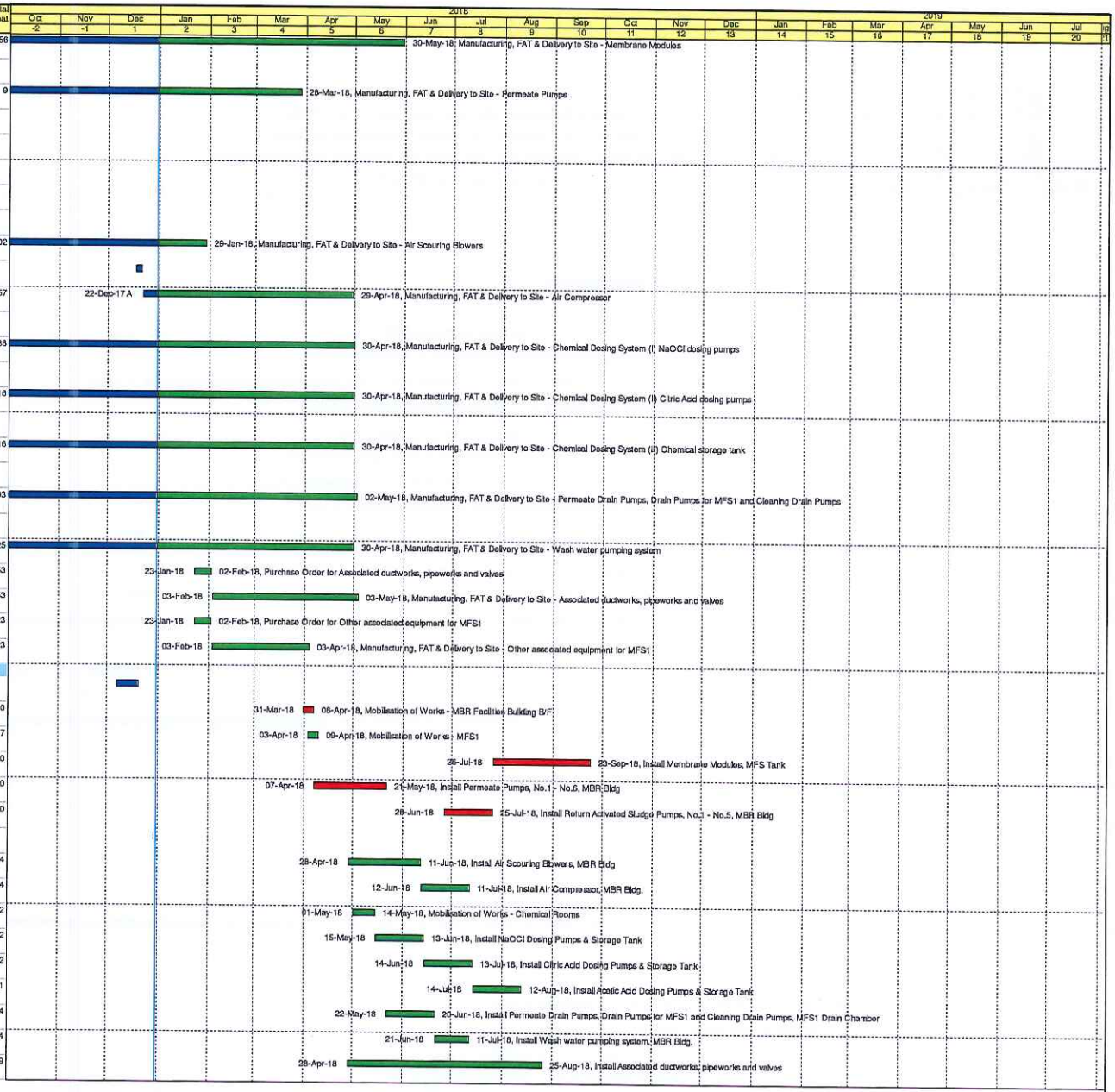
AS403012	Manufacturing, FAT & Delivery to Site - Membrane Modules	151	28-Mar-16 A	30-May-18	56
AS403030	Purchase Order for Permeate Pumps	0	13-Sep-16 A	23-Sep-16 A	
AS403032	Manufacturing, FAT & Delivery to Site - Permeate Pumps	88	07-Oct-16 A	28-Mar-18	9
AS403050	Purchase Order for Return Activated Sludge Pumps	0	13-Sep-16 A	23-Sep-16 A	
AS403052	Manufacturing, FAT & Delivery to Site - Return Activated Sludge Pumps	0	07-Oct-16 A	06-Sep-17 A	
AS403070	Purchase Order for Backwash Pumps (Item Deleted)	0	31-Aug-16 A	31-Aug-16 A	
AS403072	Manufacturing, FAT & Delivery to Site - Backwash Pumps (Item Deleted)	0	31-Aug-16 A	31-Aug-16 A	
AS403090	Purchase Order for Air Scouring Blowers	0	15-Aug-16 A	24-Aug-16 A	
AS403092	Manufacturing, FAT & Delivery to Site - Air Scouring Blowers	30	11-Apr-16 A	29-Jan-18	102
AS403110	Purchase Order for Air Compressor	0	18-Dec-17 A	21-Dec-17 A	
AS403112	Manufacturing, FAT & Delivery to Site - Air Compressor	120	22-Dec-17 A	29-Apr-18	57
AS403130	Purchase Order for Chemical Dosing System (i) NaOCl dosing pumps	0	05-Jun-17 A	29-Jun-17 A	
AS403132	Manufacturing, FAT & Delivery to Site - Chemical Dosing System (i) NaOCl dosing pumps	121	30-Jun-17 A	30-Apr-18	88
AS403150	Purchase Order for Chemical Dosing System (ii) Citric Acid dosing pumps	0	05-Jun-17 A	29-Jun-17 A	
AS403152	Manufacturing, FAT & Delivery to Site - Chemical Dosing System (ii) Citric Acid dosing pumps	121	30-Jun-17 A	30-Apr-18	116
AS403170	Purchase Order for Chemical Dosing System (iii) Chemical storage tank	0	06-Feb-17 A	28-Feb-17 A	
AS403172	Manufacturing, FAT & Delivery to Site - Chemical Dosing System (iii) Chemical storage tank	121	01-Mar-17 A	30-Apr-18	116
AS403190	Purchase Order for Permeate Drain Pumps, Drain Pumps for MFS1 and Cleaning Drain Pumps	0	28-Aug-17 A	05-Sep-17 A	
AS403192	Manufacturing, FAT & Delivery to Site - Permeate Drain Pumps, Drain Pumps for MFS1 and Cleaning Drain Pumps	123	06-Sep-17 A	02-May-18	93
AS403210	Purchase Order for Wash water pumping system	0	28-Aug-17 A	05-Sep-17 A	
AS403212	Manufacturing, FAT & Delivery to Site - Wash water pumping system	121	06-Sep-17 A	30-Apr-18	125
AS403230	Purchase Order for Associated ductworks, pipeworks and valves	11	23-Jan-18	02-Feb-18	53
AS403232	Manufacturing, FAT & Delivery to Site - Associated ductworks, pipeworks and valves	90	03-Feb-18	03-May-18	53
AS403250	Purchase Order for Other associated equipment for MFS1	11	23-Jan-18	02-Feb-18	23
AS403252	Manufacturing, FAT & Delivery to Site - Other associated equipment for MFS1	60	03-Feb-18	03-Apr-18	23
Install, T&C for MFS1 (incl. Provision for Health & Safety Requirements)					
AS403002	Mobilisation of Works - MBR Facilities Building G/F	0	07-Dec-17 A	20-Dec-17 A	
AS403002a	Mobilisation of Works - MBR Facilities Building B/F	7	31-Mar-18	06-Apr-18	0
AS403004	Mobilisation of Works - MFS1	7	03-Apr-18	09-Apr-18	17
AS403020	Install Membrane Modules, MFS Tank	60	26-Jul-18	23-Sep-18	0
AS403040	Install Permeate Pumps, No.1 - No.6, MBR Bldg	45	07-Apr-18	21-May-18	0
AS403060	Install Return Activated Sludge Pumps, No.1 - No.5, MBR Bldg	30	26-Jun-18	25-Jul-18	0
AS403080	Install Backwash Pumps -MBR Bldg (Not required)	0	30-Dec-17 A	30-Dec-17 A	
AS403100	Install Air Scouring Blowers, MBR Bldg	45	28-Apr-18	11-Jun-18	14
AS403120	Install Air Compressor, MBR Bldg.	30	12-Jun-18	11-Jul-18	14
AS403140	Mobilisation of Works - Chemical Rooms	14	01-May-18	14-May-18	72
AS403142	Install NaOCl Dosing Pumps & Storage Tank	30	15-May-18	13-Jun-18	72
AS403160	Install Citric Acid Dosing Pumps & Storage Tank	30	14-Jun-18	13-Jul-18	72
AS403180	Install Acetic Acid Dosing Pumps & Storage Tank	30	14-Jul-18	12-Aug-18	81
AS403200	Install Permeate Drain Pumps, Drain Pumps for MFS1 and Cleaning Drain Pumps, MFS1 Drain Chamber	30	22-May-18	20-Jun-18	74
AS403220	Install Wash water pumping system, MBR Bldg.	21	21-Jun-18	11-Jul-18	74
AS403240	Install Associated ductworks, pipeworks and valves	120	28-Apr-18	25-Aug-18	29



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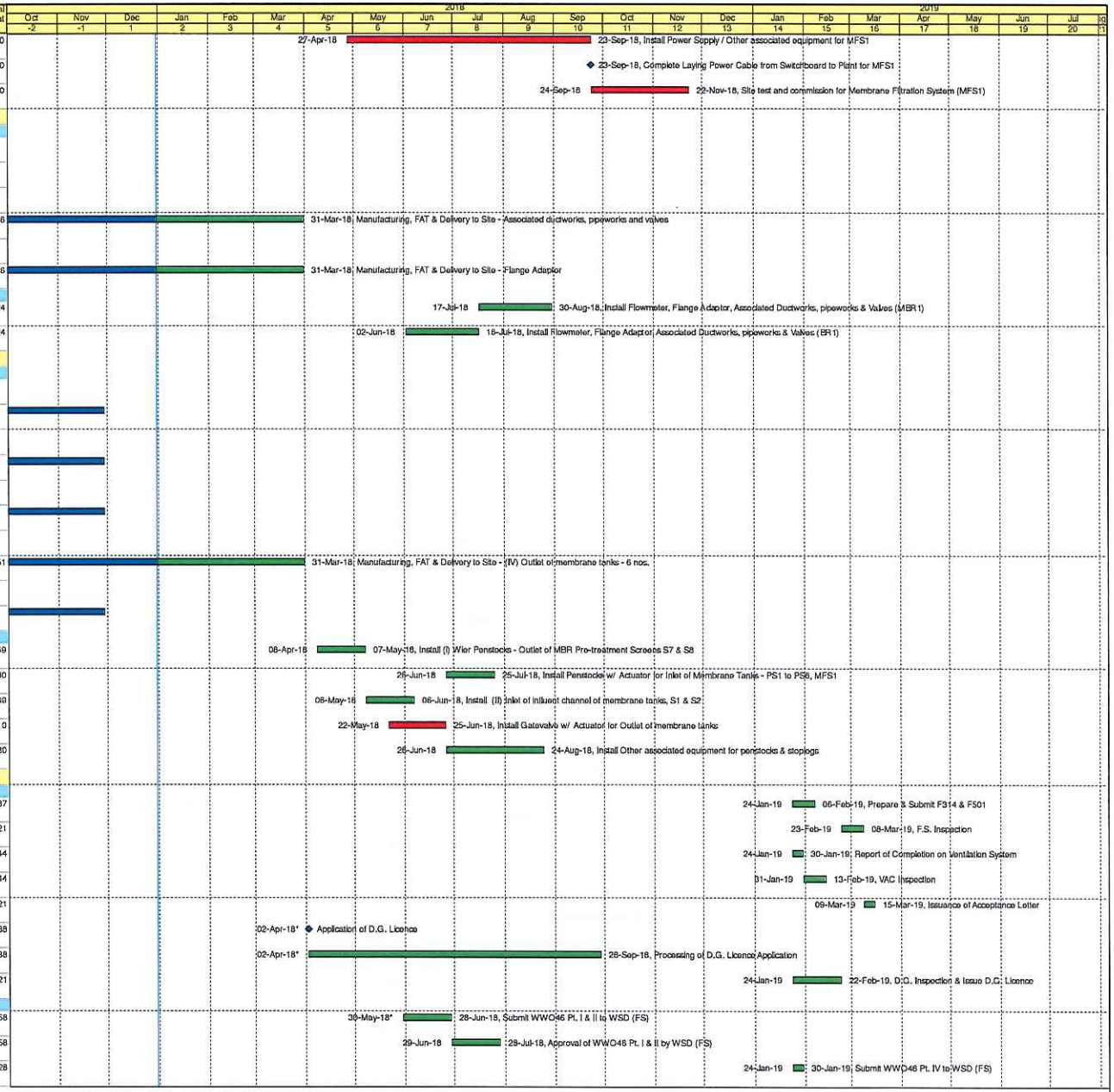
27-Mar-18	Rev. G	KH Lau	KM

Activity ID	Activity Name	Remaining Duration	Start	Finish	Total Float
AS403280	Install Power Supply / Other associated equipment for MFS1	150	27-Apr-18	23-Sep-18	0
AS403800	Complete Laying Power Cable from Switchboard to Plant for MFS1	0		23-Sep-18	0
AS403900	Site test and commission for Membrane Filtration System (MFS1)	60	24-Sep-18	22-Nov-18	0
4.4 Works for Flowmeter Chamber					
Manufacturing, FAT and Delivery					
AS404010	Purchase Order for Flowmeter	0	26-Aug-16 A	22-Sep-16 A	
AS404012	Manufacturing, FAT & Delivery to Site - Flowmeter	0	04-Oct-16 A	21-Aug-17 A	
AS404030	Purchase Order for Associated ductworks, pipeworks and valves	0	18-Sep-17 A	20-Sep-17 A	
AS404032	Manufacturing, FAT & Delivery to Site - Associated ductworks, pipeworks and valves	91	21-Sep-17 A	31-Mar-18	86
AS404050	Purchase Order for Flange Adaptor	0	18-Sep-17 A	18-Sep-17 A	
AS404052	Manufacturing, FAT & Delivery to Site - Flange Adaptor	91	21-Sep-17 A	31-Mar-18	86
Install, T&C for Flowmeter Chamber (incl. Provision for Health & Safety Requirements)					
AS404020	Install Flowmeter, Flange Adaptor, Associated Ductworks, pipeworks & Valves (MBR1)	45	17-Jul-18	30-Aug-18	24
AS404040	Install Flowmeter, Flange Adaptor, Associated Ductworks, pipeworks & Valves (BR1)	45	02-Jun-18	16-Jul-18	24
4.5 Works for Penstocks, Actuators and Stoplogs					
Manufacturing, FAT and Delivery					
AS405010	Purchase Order for (I) Weir Penstocks - Outlet of MBR Pre-treatment Screens S7 & S8	0	08-Feb-17 A	15-Feb-17 A	
AS405012	Manufacturing, FAT & Delivery to Site - (I) Weir Penstocks - Outlet of MBR Pre-treatment Screens S7 & S8	0	16-Feb-17 A	28-Nov-17 A	
AS405030	Purchase Order for (II) Inlet of influent channel of membrane tanks, S1 & S2	0	08-Feb-17 A	15-Feb-17 A	
AS405032	Manufacturing, FAT & Delivery to Site - (II) Inlet of influent channel of membrane tanks, S1 & S2	0	16-Feb-17 A	28-Nov-17 A	
AS405050	Purchase Order for (III) Inlet of membrane tanks PS1 - PS6	0	09-Feb-17 A	15-Feb-17 A	
AS405052	Customs Manufacturing, FAT & Delivery to Site - (III) Inlet of membrane tanks PS1 - PS6	0	16-Feb-17 A	28-Nov-17 A	
AS405070	Purchase Order for (IV) Outlet of membrane tanks Gate Valves	0	26-Jun-17 A	07-Jul-17 A	
AS405072	Manufacturing, FAT & Delivery to Site - (IV) Outlet of membrane tanks - 6 nos.	91	08-Jul-17 A	31-Mar-18	51
AS405090	Purchase Order for Other associated equipment for penstocks & stoplogs	0	09-Feb-17 A	15-Feb-17 A	
AS405092	Manufacturing, FAT & Delivery to Site - Other associated equipment for penstocks & stoplogs	0	16-Feb-17 A	28-Nov-17 A	
Install, T&C for Penstocks, Actuators & Stoplogs (Incl. Provision for Health & Safety Requirements)					
AS405020	Install (I) Weir Penstocks - Outlet of MBR Pre-treatment Screens S7 & S8	30	08-Apr-18	07-May-18	49
AS405040	Install Penstocks w/ Actuator for Inlet of Membrane Tanks - PS1 to PS6, MFS1	30	26-Jun-18	25-Jul-18	30
AS405060	Install (II) Inlet of influent channel of membrane tanks, S1 & S2	30	08-May-18	06-Jun-18	49
AS405080	Install Gatevalve w/ Actuator for Outlet of membrane tanks	35	22-May-18	25-Jun-18	0
AS405100	Install Other associated equipment for penstocks & stoplogs	60	26-Jun-18	24-Aug-18	30
4.6 Works for Building Services and Fire Services					
Statutory Submission / Inspection (FSD)					
AS406500	Prepare & Submit F314 & F501	14	24-Jan-19	06-Feb-19	37
AS406510	F.S. Inspection	14	23-Feb-19	08-Mar-19	21
AS406520	Report of Completion on Ventilation System	7	24-Jan-19	30-Jan-19	44
AS406530	VAC Inspection	14	31-Jan-19	13-Feb-19	44
AS406540	Issuance of Acceptance Letter	7	09-Mar-19	15-Mar-19	21
AS406550	Application of D.G. Licence	0	02-Apr-18*		138
AS406560	Processing of D.G. Licence Application	180	02-Apr-18*	28-Sep-18	138
AS406570	D.G. Inspection & Issue D.G. Licence	30	24-Jan-19	22-Feb-19	21
Statutory Submission / Inspection (WSD)					
AS406600	Submit WWO46 Pt. I & II to WSD (FS)	30	30-May-18*	28-Jun-18	158
AS406610	Approval of WWO46 Pt. I & II by WSD (FS)	30	29-Jun-18	28-Jul-18	158
AS406620	Submit WWO46 Pt. IV to WSD (FS)	7	24-Jan-19	30-Jan-19	28



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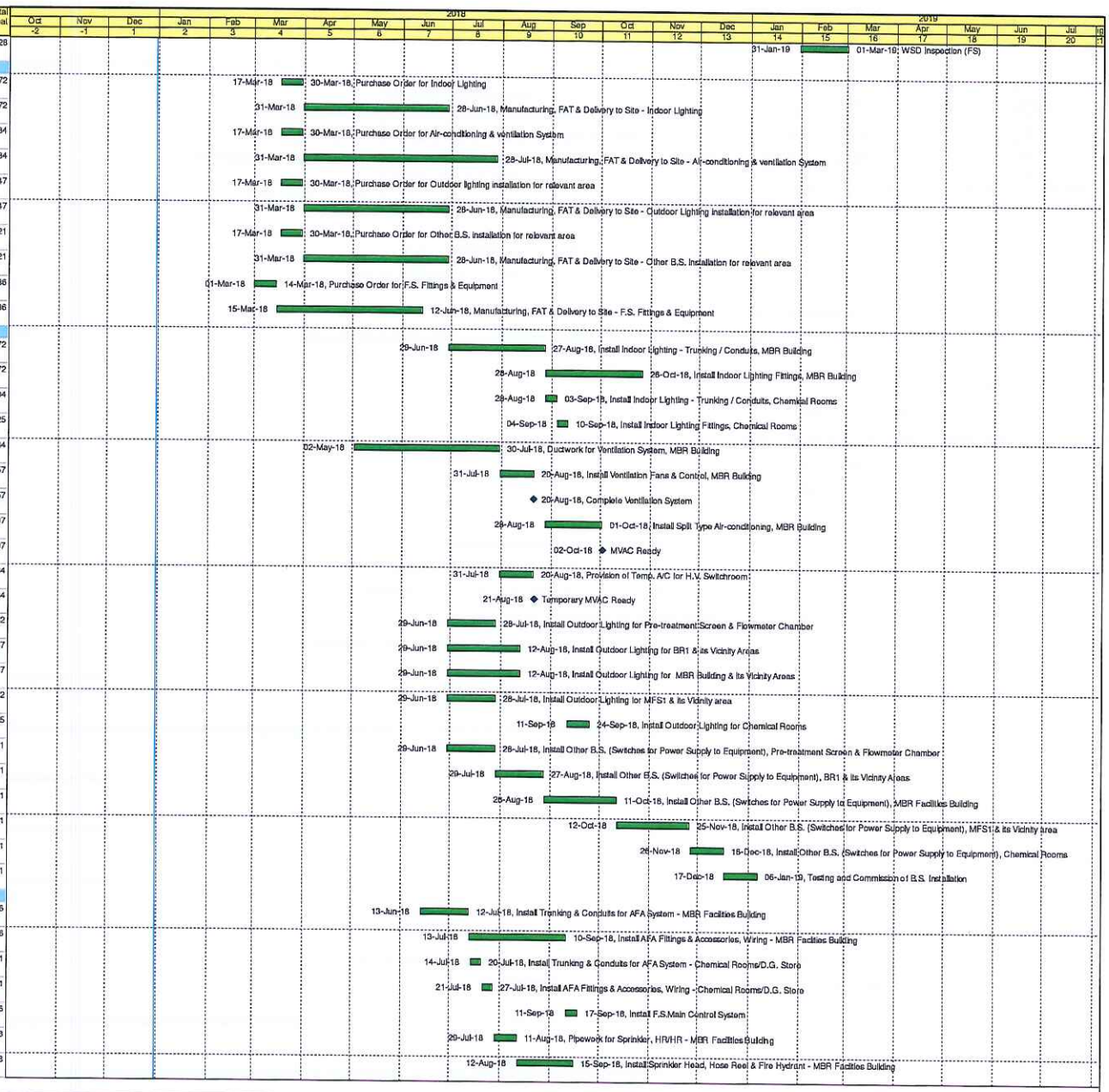
Activity ID	Activity Name	Remaining Duration	Start	Finish	Total Float
AS406630	WSD Inspection (FS)	30	31-Jan-19	01-Mar-19	28
Manufacturing, FAT and Delivery					
AS406010	Purchase Order for Indoor Lighting	14	17-Mar-18	30-Mar-18	72
AS406012	Manufacturing, FAT & Delivery to Site - Indoor Lighting	90	31-Mar-18	28-Jun-18	72
AS406030	Purchase Order for Air-conditioning & ventilation System	14	17-Mar-18	30-Mar-18	34
AS406032	Manufacturing, FAT & Delivery to Site - Air-conditioning & ventilation System	120	31-Mar-18	28-Jul-18	34
AS406050	Purchase Order for Outdoor lighting installation for relevant area	14	17-Mar-18	30-Mar-18	147
AS406052	Manufacturing, FAT & Delivery to Site - Outdoor Lighting installation for relevant area	90	31-Mar-18	28-Jun-18	147
AS406070	Purchase Order for Other B.S. installation for relevant area	14	17-Mar-18	30-Mar-18	21
AS406072	Manufacturing, FAT & Delivery to Site - Other B.S. installation for relevant area	90	31-Mar-18	28-Jun-18	21
AS406090	Purchase Order for F.S. Fittings & Equipment	14	01-Mar-18	14-Mar-18	36
AS406092	Manufacturing, FAT & Delivery to Site - F.S. Fittings & Equipment	90	15-Mar-18	12-Jun-18	36
Install, T&C for Building Services (incl. Provision for Health & Safety Requirements)					
AS406020	Install Indoor Lighting - Trunking / Conduits, MBR Building	60	29-Jun-18	27-Aug-18	72
AS406022	Install Indoor Lighting Fittings, MBR Building	60	28-Aug-18	26-Oct-18	72
AS406024	Install Indoor Lighting - Trunking / Conduits, Chemical Rooms	7	28-Aug-18	03-Sep-18	104
AS406026	Install Indoor Lighting Fittings, Chemical Rooms	7	04-Sep-18	10-Sep-18	125
AS406040	Ductwork for Ventilation System, MBR Building	90	02-May-18	30-Jul-18	34
AS406041	Install Ventilation Fans & Control, MBR Building	21	31-Jul-18	20-Aug-18	57
AS406042	Complete Ventilation System	0		20-Aug-18	57
AS406043	Install Split Type Air-conditioning, MBR Building	35	28-Aug-18	01-Oct-18	97
AS406044	MVAC Ready	0	02-Oct-18		97
AS406045	Provision of Temp. A/C for H.V. Switchroom	21	31-Jul-18	20-Aug-18	34
AS406046	Temporary MVAC Ready	0	21-Aug-18		34
AS406060	Install Outdoor Lighting for Pre-treatment Screen & Flowmeter Chamber	30	29-Jun-18	28-Jul-18	162
AS406061	Install Outdoor Lighting for BR1 & its Vicinity Areas	45	29-Jun-18	12-Aug-18	147
AS406062	Install Outdoor Lighting for MBR Building & its Vicinity Areas	45	29-Jun-18	12-Aug-18	147
AS406063	Install Outdoor Lighting for MFS1 & its Vicinity area	30	29-Jun-18	28-Jul-18	162
AS406064	Install Outdoor Lighting for Chemical Rooms	14	11-Sep-18	24-Sep-18	125
AS406080	Install Other B.S. (Switches for Power Supply to Equipment), Pre-treatment Screen & Flowmeter Chamber	30	29-Jun-18	28-Jul-18	21
AS406081	Install Other B.S. (Switches for Power Supply to Equipment), BR1 & its Vicinity Areas	30	29-Jul-18	27-Aug-18	21
AS406082	Install Other B.S. (Switches for Power Supply to Equipment), MBR Facilities Building	45	28-Aug-18	11-Oct-18	21
AS406083	Install Other B.S. (Switches for Power Supply to Equipment), MFS1 & its Vicinity area	45	12-Oct-18	25-Nov-18	21
AS406084	Install Other B.S. (Switches for Power Supply to Equipment), Chemical Rooms	21	26-Nov-18	18-Dec-18	21
AS406800	Testing and Commission of B.S. Installation	21	17-Dec-18	06-Jan-19	21
Install, T&C for Fire Services (incl. Provision for Health & Safety Requirements)					
AS406101	Install Trunking & Conduits for AFA System - MBR Facilities Building	30	13-Jun-18	12-Jul-18	36
AS406102	Install AFA Fittings & Accessories, Wiring - MBR Facilities Building	60	13-Jul-18	10-Sep-18	36
AS406104	Install Trunking & Conduits for AFA System - Chemical Rooms/D.G. Store	7	14-Jul-18	20-Jul-18	81
AS406106	Install AFA Fittings & Accessories, Wiring - Chemical Rooms/D.G. Store	7	21-Jul-18	27-Jul-18	81
AS406108	Install F.S.Main Control System	7	11-Sep-18	17-Sep-18	36
AS406180	Pipework for Sprinkler, HR/HR - MBR Facilities Building	14	29-Jul-18	11-Aug-18	158
AS406182	Install Sprinkler Head, Hose Reel & Fire Hydrant - MBR Facilities Building	35	12-Aug-18	15-Sep-18	158



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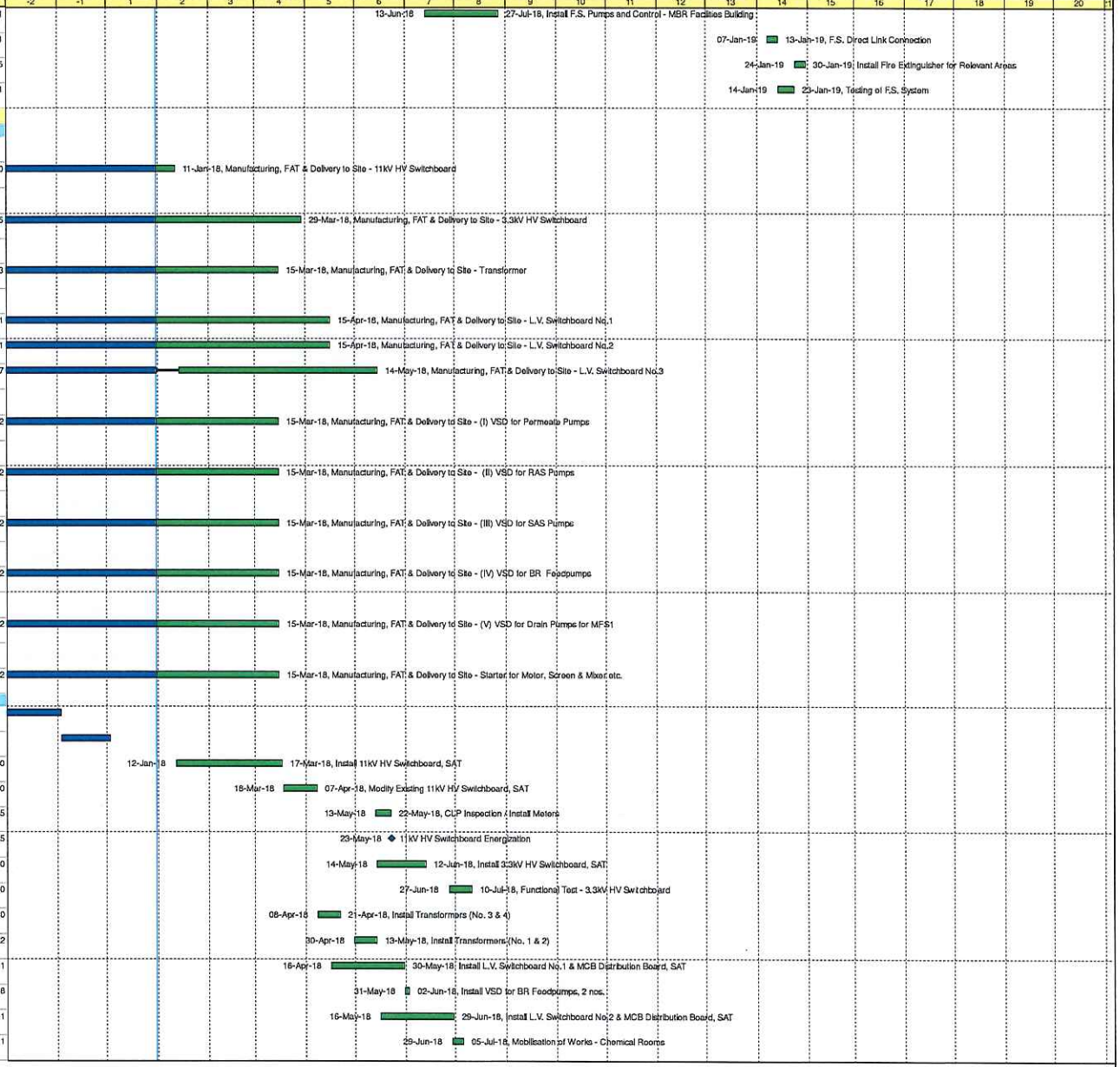
27-Mar-18	Rev. G	KH Lau	KM

Activity ID	Activity Name	Remaining Duration	Start	Finish	Total Float
AS406184	Install F.S. Pumps and Control - MBR Facilities Building	45	13-Jun-18	27-Jul-18	81
AS406240	F.S. Direct Link Connection	7	07-Jan-19	13-Jan-19	21
AS406260	Install Fire Extinguisher for Relevant Areas	7	24-Jan-19	30-Jan-19	65
AS406900	Testing of F.S. System	10	14-Jan-19	23-Jan-19	21
	4.7 HV Switchgear, Transformer, LV Switchgear, LV Control Gear etc..				
	Manufacturing, FAT and Delivery				
AS407010	Purchase Order for 11kV HV Switchboard	0	12-Sep-16 A	21-Sep-16 A	
AS407012	Manufacturing, FAT & Delivery to Site - 11kV HV Switchboard	12	07-Oct-16 A	11-Jan-18	30
AS407030	Purchase Order for 3.3kV HV Switchboard	0	12-Sep-16 A	21-Sep-16 A	
AS407032	Manufacturing, FAT & Delivery to Site - 3.3kV HV Switchboard	89	07-Oct-16 A	29-Mar-18	85
AS407050	Purchase Order for Transformer	0	13-Sep-16 A	21-Sep-16 A	
AS407052	Manufacturing, FAT & Delivery to Site - Transformer	75	07-Oct-16 A	15-Mar-18	53
AS407070	Purchase Order for L.V. Switchboard	0	13-Sep-16 A	22-Sep-16 A	
AS407072	Manufacturing, FAT & Delivery to Site - L.V. Switchboard No.1	106	30-Sep-16 A	15-Apr-18	1
AS407074	Manufacturing, FAT & Delivery to Site - L.V. Switchboard No.2	106	30-Sep-16 A	15-Apr-18	31
AS407076	Manufacturing, FAT & Delivery to Site - L.V. Switchboard No.3	121	30-Sep-16 A	14-May-18	37
AS407090	Purchase Order for (I) VSD for Permeate Pumps	0	03-Mar-17 A	16-Mar-17 A	
AS407092	Manufacturing, FAT & Delivery to Site - (I) VSD for Permeate Pumps	75	17-Mar-17 A	15-Mar-18	32
AS407110	Purchase Order for (II) VSD for RAS Pumps	0	03-Mar-17 A	16-Mar-17 A	
AS407112	Manufacturing, FAT & Delivery to Site - (II) VSD for RAS Pumps	75	17-Mar-17 A	15-Mar-18	32
AS407130	Purchase Order for (III) VSD for SAS Pumps	0	03-Mar-17 A	16-Mar-17 A	
AS407132	Manufacturing, FAT & Delivery to Site - (III) VSD for SAS Pumps	75	17-Mar-17 A	15-Mar-18	32
AS407150	Purchase Order for (IV) VSD for BR Feedpumps	0	03-Mar-17 A	16-Mar-17 A	
AS407152	Manufacturing, FAT & Delivery to Site - (IV) VSD for BR Feedpumps	75	17-Mar-17 A	15-Mar-18	32
AS407170	Purchase Order for (V) VSD for Drain Pumps for MFS1	0	03-Mar-17 A	16-Mar-17 A	
AS407172	Manufacturing, FAT & Delivery to Site - (V) VSD for Drain Pumps for MFS1	75	17-Mar-17 A	15-Mar-18	32
AS407190	Purchase Order for Starter for Motor, Screen & Mixer etc.	0	13-Sep-16 A	22-Sep-16 A	
AS407192	Manufacturing, FAT & Delivery to Site - Starter for Motor, Screen & Mixer etc.	75	30-Sep-16 A	15-Mar-18	32
	Install, T&C for MBR Facilities Building (incl. Provision for Health & Safety Requirements)				
AS407001	Mobilisation & Preparation Works - MBR Facilities Building CLP RmC & D	0	30-Sep-17 A	02-Nov-17 A	
AS407002	Mobilisation of Works - MBR Facilities Building	0	03-Nov-17 A	02-Dec-17 A	
AS407020	Install 11kV HV Switchboard, SAT	65	12-Jan-18	17-Mar-18	30
AS407022	Modify Existing 11kV HV Switchboard, SAT	21	18-Mar-18	07-Apr-18	30
AS407024	CLP Inspection / Install Meters	10	13-May-18	22-May-18	75
AS407026	11kV HV Switchboard Energization	0	23-May-18		75
AS407040	Install 3.3kV HV Switchboard, SAT	30	14-May-18	12-Jun-18	40
AS407042	Functional Test - 3.3kV HV Switchboard	14	27-Jun-18	10-Jul-18	40
AS407060	Install Transformers (No. 3 & 4)	14	08-Apr-18	21-Apr-18	30
AS407062	Install Transformers (No. 1 & 2)	14	30-Apr-18	13-May-18	22
AS407080	Install L.V. Switchboard No.1 & MCB Distribution Board, SAT	45	16-Apr-18	30-May-18	1
AS407081	Install VSD for BR Feedpumps, 2 nos.	3	31-May-18	02-Jun-18	48
AS407082	Install L.V. Switchboard No.2 & MCB Distribution Board, SAT	45	16-May-18	29-Jun-18	1
AS407083	Mobilisation of Works - Chemical Rooms	7	29-Jun-18	05-Jul-18	1



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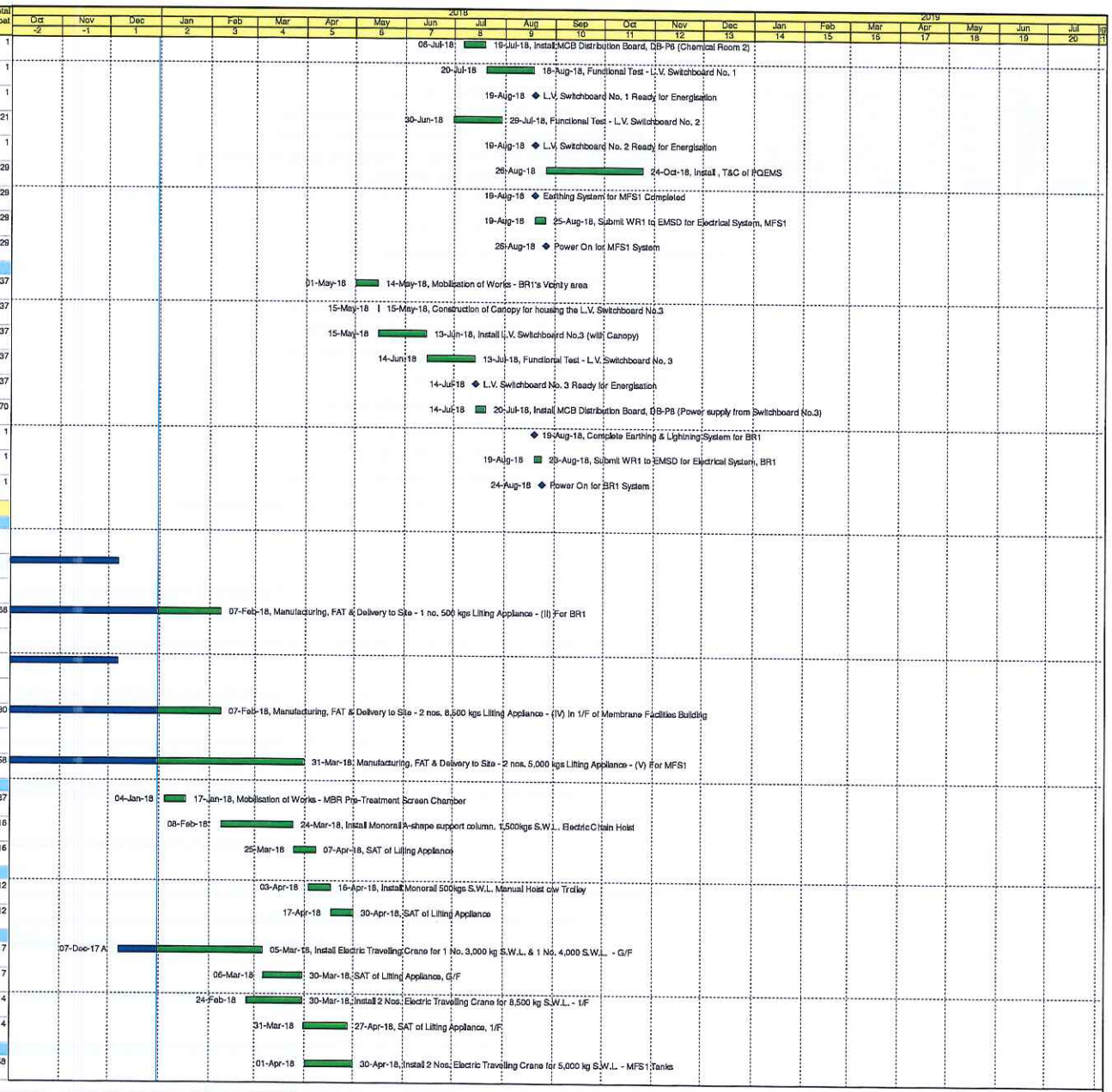
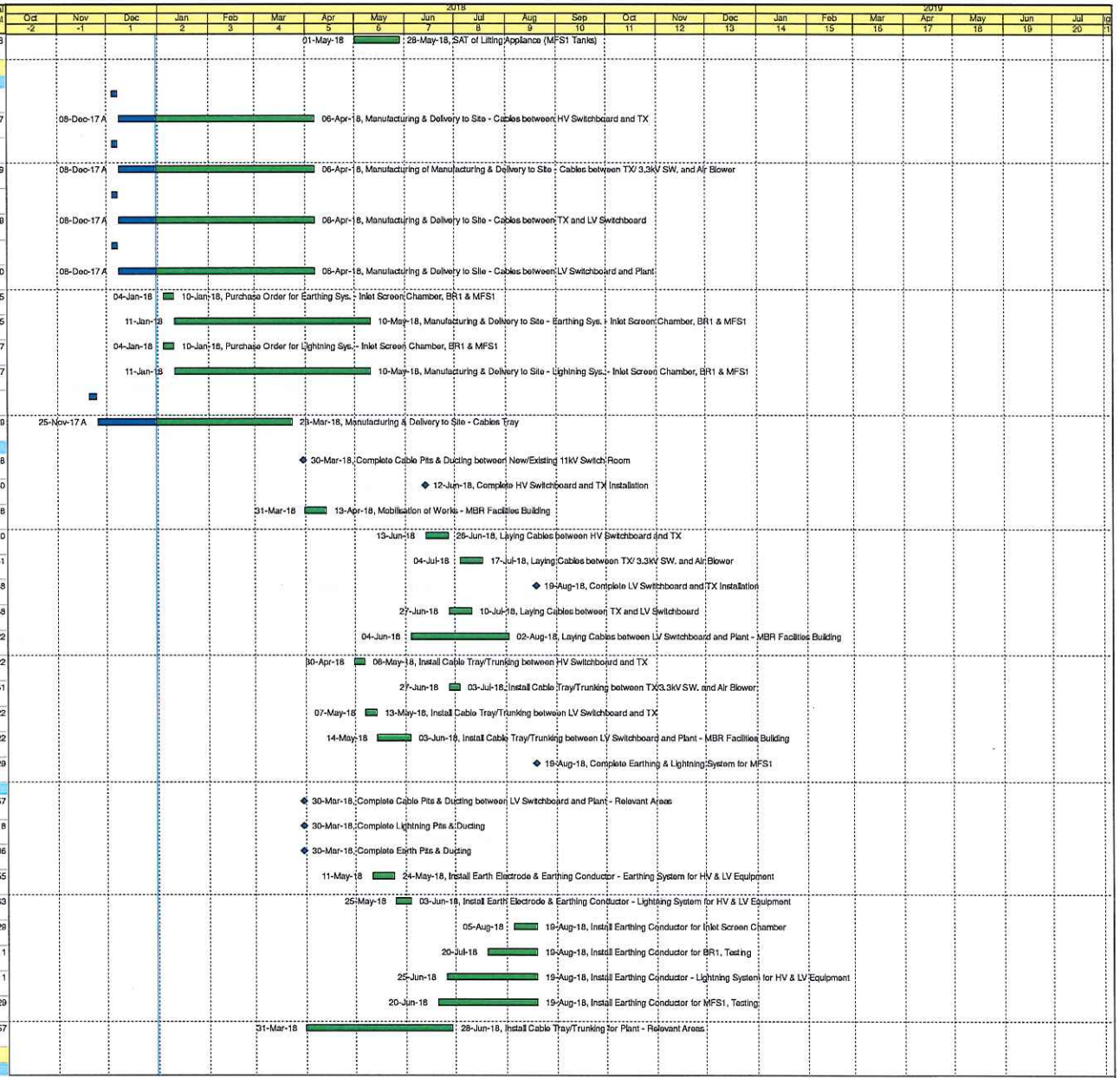
27-Mar-18	Rev. G	KH Lau	KM

Activity ID	Activity Name	Remaining Duration	Start	Finish	Total Float
AS407084	Install MCB Distribution Board, DB-P6 (Chemical Room 2)	14	06-Jul-18	19-Jul-18	1
AS407085	Functional Test - L.V. Switchboard No. 1	30	20-Jul-18	18-Aug-18	1
AS407086	L.V. Switchboard No. 1 Ready for Energisation	0	19-Aug-18		1
AS407087	Functional Test - L.V. Switchboard No. 2	30	30-Jun-18	29-Jul-18	21
AS407088	L.V. Switchboard No. 2 Ready for Energisation	0	19-Aug-18		1
AS407500	Install , T&C of PQEMS	60	26-Aug-18	24-Oct-18	29
AS407600	Earthing System for MFS1 Completed	0	19-Aug-18		29
AS407620	Submit WR1 to EMSD for Electrical System, MFS1	7	19-Aug-18	25-Aug-18	29
AS407640	Power On for MFS1 System	0	26-Aug-18		29
	Install, T&C for BR1's Vicinity Area (incl. Provision for Health & Safety Requirements)				
AS407003	Mobilisation of Works - BR1's vicinity area	14	01-May-18	14-May-18	37
AS407004	Construction of Canopy for housing the L.V. Switchboard No.3	0	15-May-18	15-May-18	37
AS407089a	Install L.V. Switchboard No.3 (with Canopy)	30	15-May-18	13-Jun-18	37
AS407089b	Functional Test - L.V. Switchboard No. 3	30	14-Jun-18	13-Jul-18	37
AS407089c	L.V. Switchboard No. 3 Ready for Energisation	0	14-Jul-18		37
AS407089d	Install MCB Distribution Board, DB-P8 (Power supply from Switchboard No.3)	7	14-Jul-18	20-Jul-18	170
AS407700	Complete Earthing & Lightning System for BR1	0		19-Aug-18	1
AS407720	Submit WR1 to EMSD for Electrical System, BR1	5	19-Aug-18	23-Aug-18	1
AS407740	Power On for BR1 System	0	24-Aug-18		1
	4.8 Lifting Appliance				
	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 A	14-Feb-17 A	
AS408012	Manufacturing, FAT & Delivery to Site - 1 no. 1,500 kgs Lifting Appliance - (I) For Pre-treatment Screen Chamber	0	15-Feb-17 A	06-Dec-17 A	
AS408030	Purchase Order for 1 no. 500 kgs Lifting Appliance - (II) For BR1	0	08-Feb-17 A	14-Feb-17 A	
AS408032	Manufacturing, FAT & Delivery to Site - 1 no. 500 kgs Lifting Appliance - (II) For BR1	39	15-Feb-17 A	07-Feb-18	68
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 A	14-Feb-17 A	
AS408052	Manufacturing, FAT & Delivery to Site - 1 no. 3,000 kgs & 1 no. 4,000 kgs Lifting Appliance - (III) In G/F of MF Bldg.	0	15-Feb-17 A	06-Dec-17 A	
AS408070	Purchase Order for 2 nos. 8,500 kgs Lifting Appliance - (IV) In 1/F of Membrane Facilities Building	0	08-Feb-17 A	14-Feb-17 A	
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 A	07-Feb-18	30
AS408090	Purchase Order for 2 nos. 5,000 kgs Lifting Appliance - (V) For MFS1	0	08-Feb-17 A	14-Feb-17 A	
AS408092	Manufacturing, FAT & Delivery to Site - 2 nos. 5,000 kgs Lifting Appliance - (V) For MFS1	91	15-Feb-17 A	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-Jan-18	17-Jan-18	37
AS408022	Install Monorail A-shape 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 Monorail 500kgs S.W.L. Manual Hoist c/w 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)				
AS408060	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 A	05-Mar-18	7
AS408062	SAT of Lifting Appliance, G/F	25	06-Mar-18	30-Mar-18	7
AS408080	Install 2 Nos. Electric Travelling Crane for 8,500 kg S.W.L. - 1/F	35	24-Feb-18	30-Mar-18	14
AS408082	SAT of Lifting Appliance, 1/F	28	31-Mar-18	27-Apr-18	14
	Install, T&C for MFS1 (incl. Provision for Health & Safety Requirements)				
AS408101	Install 2 Nos. Electric Travelling Crane for 5,000 kg S.W.L. - MFS1 Tanks	30	01-Apr-18	30-Apr-18	58



Activity ID	Activity Name	Remaining Duration	Start	Finish	Total Float
AS408102	SAT of Lifting Appliance (MFS1 Tanks)	28	01-May-18	28-May-18	58
4.9 Cabling, Earthing and Lightning Protection System					
Manufacturing, FAT and Delivery					
AS409010	Purchase Order for Cables between HV Switchboard and TX	0	04-Dec-17 A	07-Dec-17 A	
AS409012	Manufacturing & Delivery to Site - Cables between HV Switchboard and TX	97	08-Dec-17 A	06-Apr-18	107
AS409014	Purchase Order for Cables between TX/ 3.3kV SW. and Air Blower	0	04-Dec-17 A	07-Dec-17 A	
AS409016	Manufacturing of Manufacturing & Delivery to Site - Cables between TX/ 3.3kV SW. and Air Blower	97	08-Dec-17 A	06-Apr-18	149
AS409030	Purchase Order for Cables between TX and LV Switchboard	0	04-Dec-17 A	07-Dec-17 A	
AS409032	Manufacturing & Delivery to Site - Cables between TX and LV Switchboard	97	08-Dec-17 A	06-Apr-18	149
AS409050	Purchase Order for Cables between LV Switchboard and Plant	0	04-Dec-17 A	07-Dec-17 A	
AS409052	Manufacturing & Delivery to Site - Cables between LV Switchboard and Plant	97	08-Dec-17 A	06-Apr-18	80
AS409070	Purchase Order for Earthing Sys. - Inlet Screen Chamber, BR1 & MFS1	7	04-Jan-18	10-Jan-18	55
AS409072	Manufacturing & Delivery to Site - Earthing Sys. - Inlet Screen Chamber, BR1 & MFS1	120	11-Jan-18	10-May-18	55
AS409090	Purchase Order for Lightning Sys. - Inlet Screen Chamber, BR1 & MFS1	7	04-Jan-18	10-Jan-18	77
AS409092	Manufacturing & Delivery to Site - Lightning Sys. - Inlet Screen Chamber, BR1 & MFS1	120	11-Jan-18	10-May-18	77
AS409110	Purchase Order for Cables Tray	0	20-Nov-17 A	24-Nov-17 A	
AS409112	Manufacturing & Delivery to Site - Cables Tray	83	25-Nov-17 A	23-Mar-18	59
Install, T&C for MBR Facilities Building (Incl. Provision for Health & Safety Requirements)					
AS409001	Complete Cable Pits & Ducting between New/Existing 11kV Switch Room	0		30-Mar-18	38
AS409002	Complete HV Switchboard and TX Installation	0		12-Jun-18	40
AS409003	Mobilisation of Works - MBR Facilities Building	14	31-Mar-18	13-Apr-18	38
AS409020	Laying Cables between HV Switchboard and TX	14	13-Jun-18	26-Jun-18	40
AS409022	Laying Cables between TX/ 3.3kV SW. and Air Blower	14	04-Jul-18	17-Jul-18	61
AS409039	Complete LV Switchboard and TX Installation	0		19-Aug-18	248
AS409040	Laying Cables between TX and LV Switchboard	14	27-Jun-18	10-Jul-18	68
AS409060	Laying Cables between LV Switchboard and Plant - MBR Facilities Building	60	04-Jun-18	02-Aug-18	22
AS409121	Install Cable Tray/Trunking between HV Switchboard and TX	7	30-Apr-18	06-May-18	22
AS409122	Install Cable Tray/Trunking between TX/3.3kV SW. and Air Blower	7	27-Jun-18	03-Jul-18	61
AS409123	Install Cable Tray/Trunking between LV Switchboard and TX	7	07-May-18	13-May-18	22
AS409124	Install Cable Tray/Trunking between LV Switchboard and Plant - MBR Facilities Building	21	14-May-18	03-Jun-18	22
AS409900	Complete Earthing & Lightning System for MFS1	0		19-Aug-18	29
Install, T&C for Plant's Vicinity Areas (Incl. Provision for Health & Safety Requirements)					
AS409006	Complete Cable Pits & Ducting between LV Switchboard and Plant - Relevant Areas	0		30-Mar-18	57
AS409007	Complete Lightning Pits & Ducting	0		30-Mar-18	118
AS409080	Complete Earth Pits & Ducting	0		30-Mar-18	96
AS409081	Install Earth Electrode & Earthing Conductor - Earthing System for HV & LV Equipment	14	11-May-18	24-May-18	55
AS409082	Install Earth Electrode & Earthing Conductor - Lightning System for HV & LV Equipment	10	25-May-18	03-Jun-18	63
AS409083	Install Earthing Conductor for Inlet Screen Chamber	14	05-Aug-18	19-Aug-18	29
AS409084	Install Earthing Conductor for BR1, Testing	30	20-Jul-18	19-Aug-18	1
AS409085	Install Earthing Conductor - Lightning System for HV & LV Equipment	55	25-Jun-18	19-Aug-18	1
AS409086	Install Earthing Conductor for MFS1, Testing	60	20-Jun-18	19-Aug-18	29
AS409125	Install Cable Tray/Trunking for Plant - Relevant Areas	90	31-Mar-18	28-Jun-18	57
4.10 Deodorising System					
Manufacturing, FAT and Delivery					



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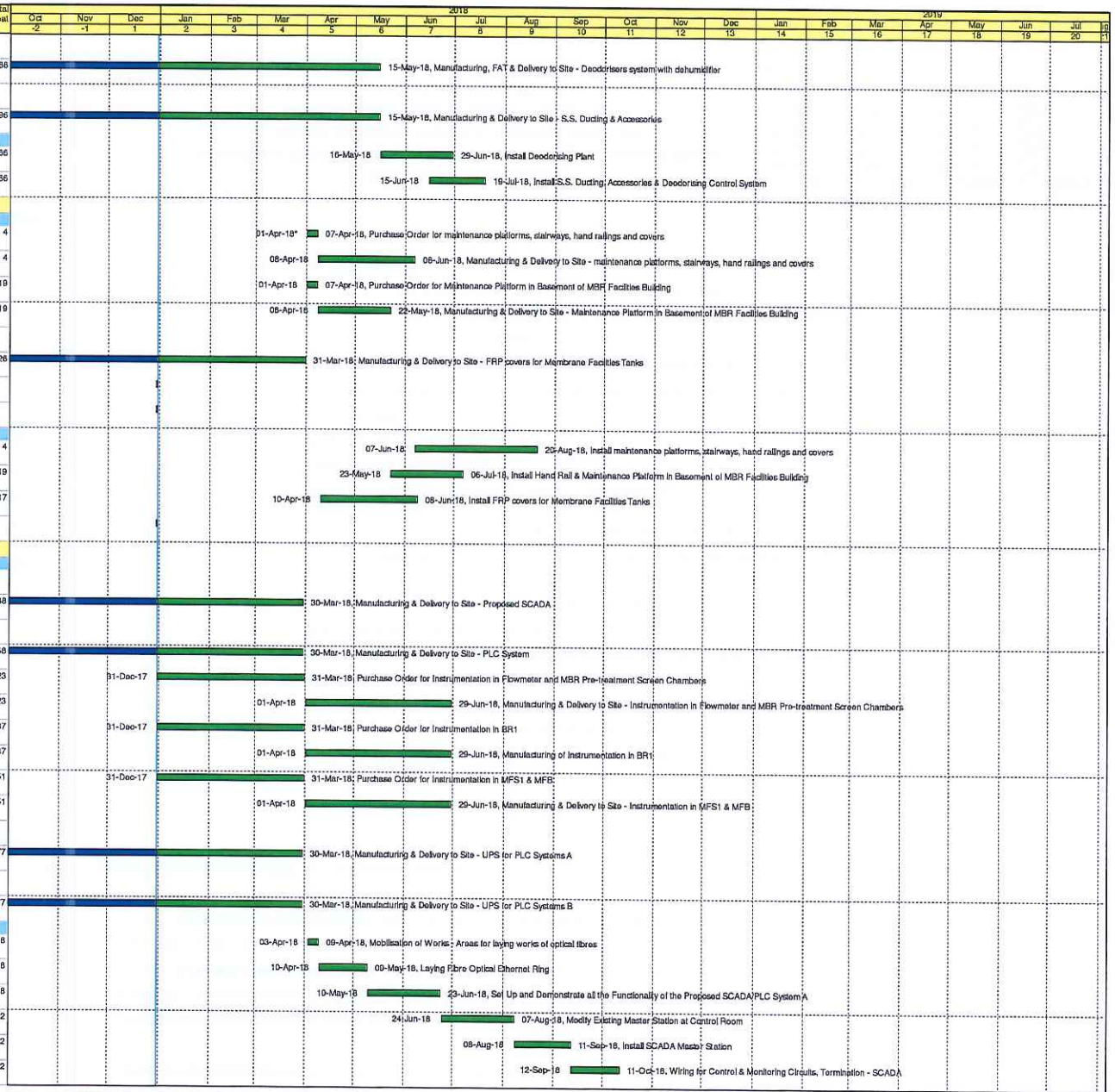
17-Oct-17	Rev. F	KH Lau	KM
27-Mar-18	Rev. G	KH Lau	KM

Activity ID	Activity Name	Remaining Duration	Start	Finish	Total Float
AS410010	Purchase Order for Deodorisers system with dehumidifier	0	10-Jul-17 A	26-Jul-17 A	
AS410012	Manufacturing, FAT & Delivery to Site - Deodorisers system with dehumidifier	138	27-Jul-17 A	15-May-18	86
AS410030	Purchase Order for S.S. Ducting & Accessories	0	24-Jul-17 A	26-Jul-17 A	
AS410032	Manufacturing & Delivery to Site - S.S. Ducting & Accessories	136	27-Jul-17 A	15-May-18	86
	Install, T&C for MBR Facilities Building (Incl. Provision for Health & Safety Requirements)				
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				
	Manufacturing, FAT and Delivery				
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	60	08-Apr-18	06-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-17 A	08-May-17 A	
AS411052	Manufacturing & Delivery to Site - FRP covers for Membrane Facilities Tanks	91	09-May-17 A	31-Mar-18	26
AS411070	Purchase Order for Steel Cover for Air Blower Opening on 1/F of MBR Bldg. (Not required)	0	30-Dec-17 A	30-Dec-17 A	
AS411072	Manufacturing & Delivery to Site - Steel Cover for Air Blower Opening on 1/F of MBR Bldg. (Not required)	0	30-Dec-17 A	30-Dec-17 A	
	Install, T&C 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	60	10-Apr-18	08-Jun-18	17
AS411080	Install Steel Cover for Air Blower Opening on 1/F of MBR Bldg. (Not required)	0	30-Dec-17 A	30-Dec-17 A	
	4.12 SCADA				
	Manufacturing, FAT and Delivery				
AS412010	Purchase Order for Proposed SCADA	0	03-Jul-17 A	18-Jul-17 A	
AS412012	Manufacturing & Delivery to Site - Proposed SCADA	90	19-Jul-17 A	30-Mar-18	48
AS412030	Purchase Order for PLC System	0	10-Jul-17 A	18-Jul-17 A	
AS412032	Manufacturing & Delivery to Site - PLC System	90	19-Jul-17 A	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-17 A	18-Jul-17 A	
AS412112	Manufacturing & Delivery to Site - UPS for PLC Systems A	90	19-Jul-17 A	30-Mar-18	177
AS412130	Purchase Order UPS for PLC Systems B	0	03-Jul-17 A	18-Jul-17 A	
AS412132	Manufacturing & Delivery to Site - UPS for PLC Systems B	90	19-Jul-17 A	30-Mar-18	177
	Install, T&C for SCADA (Incl. Provision for Health & Safety Requirements)				
AS412001	Mobilisation 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	23-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-Aug-18	11-Sep-18	12
AS412024	Wiring for Control & Monitoring Circuits, Termination - SCADA	30	12-Sep-18	11-Oct-18	12



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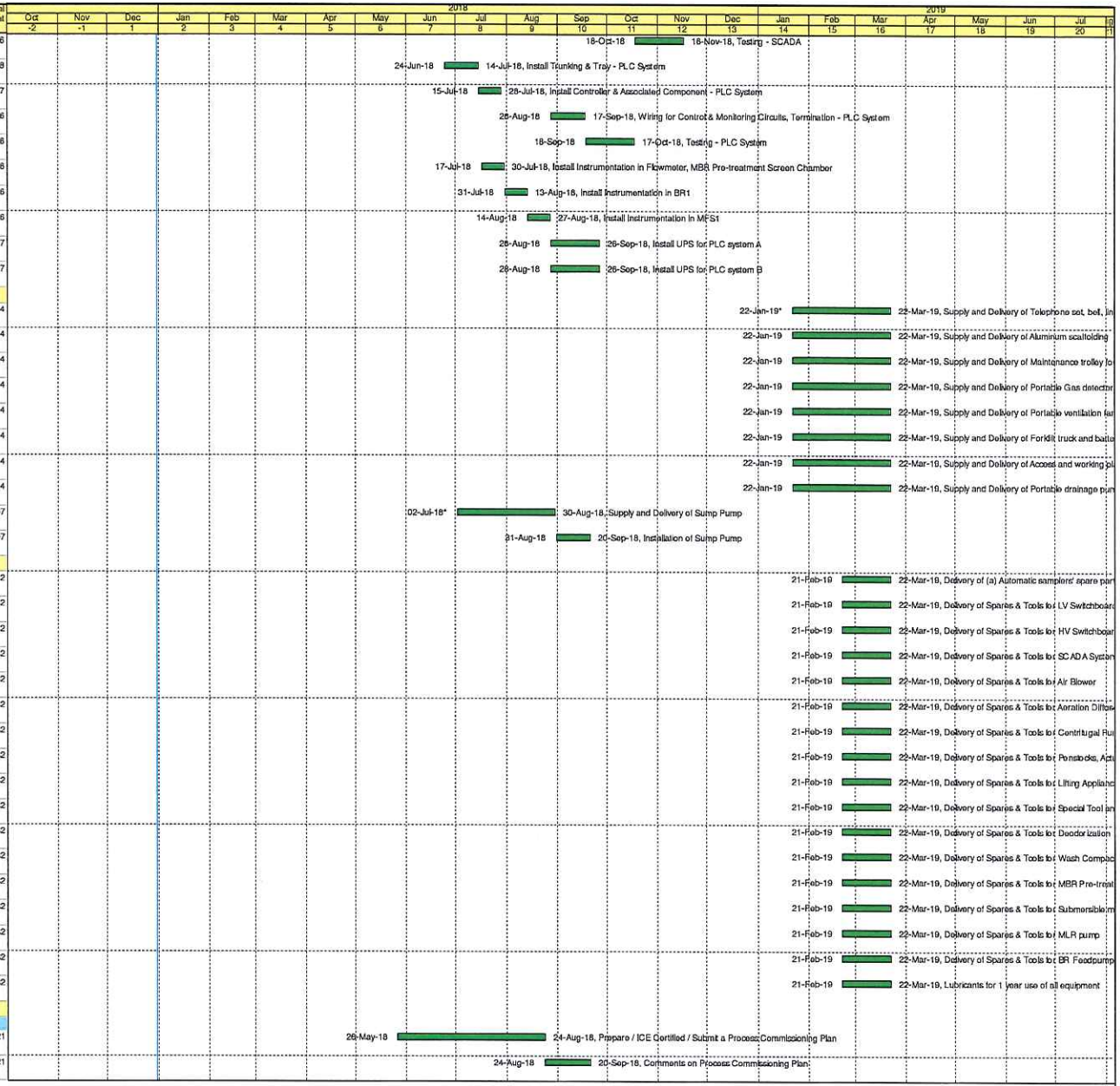
27-Mar-18	Rev. G	KH Lau	KM

Activity ID	Activity Name	Remaining Duration	Start	Finish	Total Float
AS412025	Testing - SCADA	30	18-Oct-18	16-Nov-18	6
AS412040	Install Trunking & Tray - PLC System	21	24-Jun-18	14-Jul-18	8
AS412042	Install Controller & Associated Component - PLC System	14	15-Jul-18	28-Jul-18	57
AS412044	Wiring for Control & Monitoring Circuits, Termination - PLC System	21	28-Aug-18	17-Sep-18	6
AS412046	Testing - PLC System	30	18-Sep-18	17-Oct-18	6
AS412060	Install Instrumentation in Flowmeter, MBR Pre-treatment Screen Chamber	14	17-Jul-18	30-Jul-18	6
AS412080	Install Instrumentation in BR1	14	31-Jul-18	13-Aug-18	6
AS412100	Install Instrumentation in MFS1	14	14-Aug-18	27-Aug-18	6
AS412120	Install UPS for PLC system A	30	28-Aug-18	26-Sep-18	27
AS412140	Install UPS for PLC system B	30	28-Aug-18	26-Sep-18	27
4.13 Supply & Delivery of Miscellaneous Equipment					
AS413010	Supply and Delivery of Telephone set, bell, line and accessories	60	22-Jan-19*	22-Mar-19	14
AS413020	Supply and Delivery of Aluminum scaffolding	60	22-Jan-19	22-Mar-19	14
AS413030	Supply and Delivery of Maintenance trolley for Air Circuit Breaker	60	22-Jan-19	22-Mar-19	14
AS413040	Supply and Delivery of Portable Gas detector	60	22-Jan-19	22-Mar-19	14
AS413050	Supply and Delivery of Portable ventilation fan	60	22-Jan-19	22-Mar-19	14
AS413060	Supply and Delivery of Forklift truck and battery charger	60	22-Jan-19	22-Mar-19	14
AS413070	Supply and Delivery of Access and working platforms	60	22-Jan-19	22-Mar-19	14
AS413080	Supply and Delivery of Portable drainage pump	60	22-Jan-19	22-Mar-19	14
AS413090	Supply and Delivery of Sump Pump	60	02-Jul-18*	30-Aug-18	197
AS413100	Installation of Sump Pump	21	31-Aug-18	20-Sep-18	197
4.14 Supply & Delivery of Spares & Tools					
AS414010	Delivery of (a) Automatic samplers' spare parts & (b) Sight glasses for MFS	30	21-Feb-19	22-Mar-19	32
AS414020	Delivery of Spares & Tools for LV Switchboard, Control Panels and SCADA System	30	21-Feb-19	22-Mar-19	32
AS414030	Delivery of Spares & Tools for HV Switchboard (including capacitor correction units)	30	21-Feb-19	22-Mar-19	32
AS414040	Delivery of Spares & Tools for SCADA System, PLC system and Instrumentation	30	21-Feb-19	22-Mar-19	32
AS414050	Delivery of Spares & Tools for Air Blower	30	21-Feb-19	22-Mar-19	32
AS414060	Delivery of Spares & Tools for Aeration Diffuser	30	21-Feb-19	22-Mar-19	32
AS414070	Delivery of Spares & Tools for Centrifugal Pump	30	21-Feb-19	22-Mar-19	32
AS414080	Delivery of Spares & Tools for Penstocks, Actuator and Valve	30	21-Feb-19	22-Mar-19	32
AS414090	Delivery of Spares & Tools for Lifting Appliances	30	21-Feb-19	22-Mar-19	32
AS414100	Delivery of Spares & Tools for Special Tool and measuring equipment	30	21-Feb-19	22-Mar-19	32
AS414110	Delivery of Spares & Tools for Deodorization Unit	30	21-Feb-19	22-Mar-19	32
AS414120	Delivery of Spares & Tools for Wash Compactor	30	21-Feb-19	22-Mar-19	32
AS414130	Delivery of Spares & Tools for MBR Pre-treatment Screens	30	21-Feb-19	22-Mar-19	32
AS414140	Delivery of Spares & Tools for Submersible mixer	30	21-Feb-19	22-Mar-19	32
AS414150	Delivery of Spares & Tools for MLR pump	30	21-Feb-19	22-Mar-19	32
AS414160	Delivery of Spares & Tools for BR Feedpump	30	21-Feb-19	22-Mar-19	32
AS414170	Lubricants for 1 year use of all equipment	30	21-Feb-19	22-Mar-19	32
Process Commissioning					
Commissioning Plan & Procedure					
AS112010	Prepare / ICE Certified / Submit a Process Commissioning Plan	90	26-May-18	24-Aug-18	21
AS112012	Comments on Process Commissioning Plan	28	24-Aug-18	20-Sep-18	21



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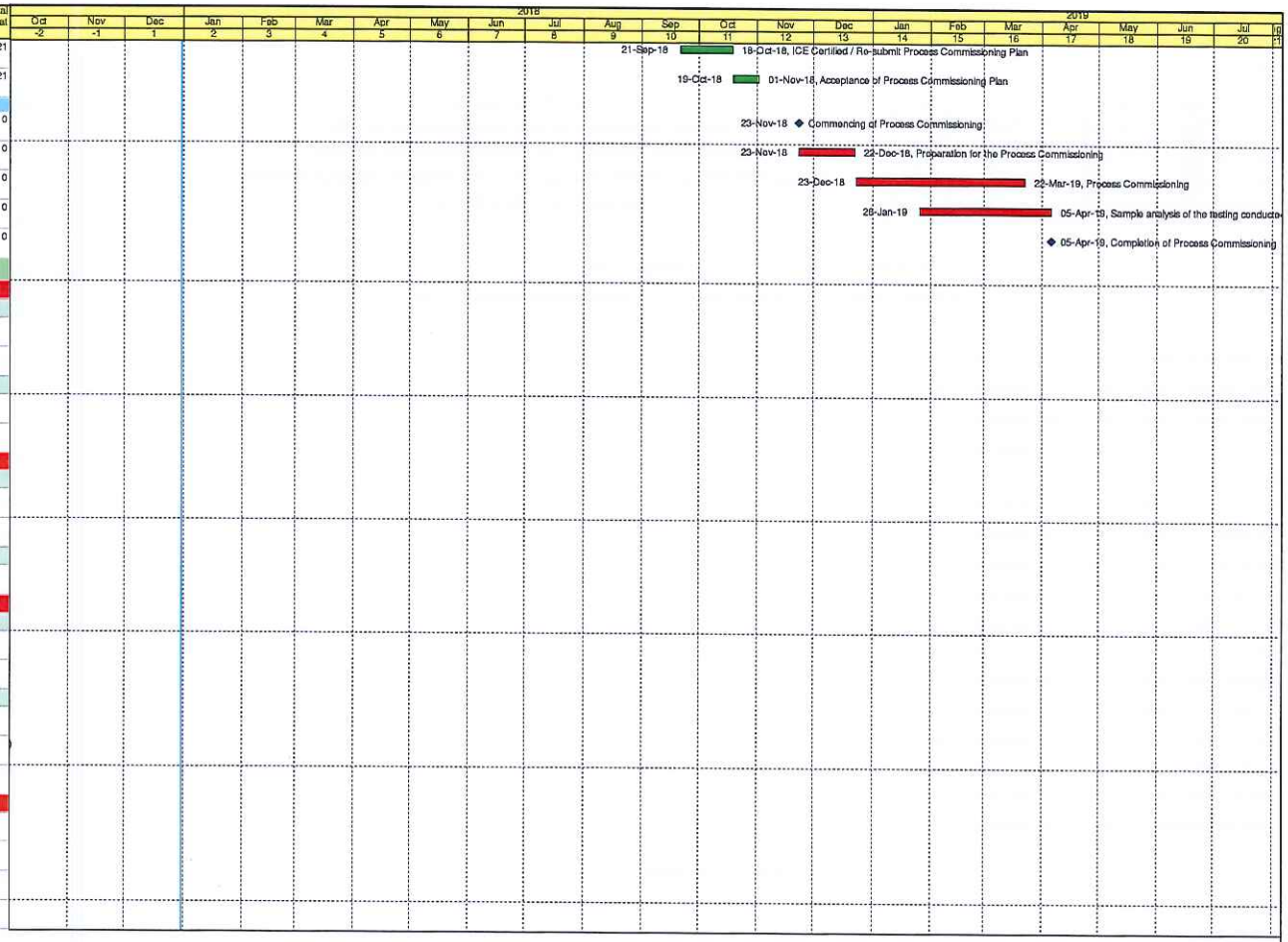
27-Mar-18	Rev. G	KH Lau	KM

Activity ID	Activity Name	Remaining Duration	Start	Finish	Total Float
AS112014	ICE Certified / Re-submit Process Commissioning Plan	28	21-Sep-18	18-Oct-18	21
AS112016	Acceptance of Process Commissioning Plan	14	19-Oct-18	01-Nov-18	21
Commissioning Process Period					
AS112020	Commencing of Process Commissioning	0	23-Nov-18		0
AS112022	Preparation for the Process Commissioning	30	23-Nov-18	22-Dec-18	0
AS112024	Process Commissioning	90	23-Dec-18	22-Mar-19	0
AS112030	Sample analysis of the testing conducted for process commissioning by an Independent Lab. (HOKLAS)	70	26-Jan-19	05-Apr-19	0
AS112040	Completion of Process Commissioning	0		05-Apr-19	0
Section IV of Works					
Valve with Electric Actuators					
Manufacturing, FAT and Delivery					
AS501100	Procument of Valves with electric actuators	0	13-Feb-16 A	28-Apr-16 A	
AS501120	Manufacturing & Delivery / FAT of Valve with electric actuators	0	29-Mar-16 A	09-Sep-16 A	
Install, T&C for Valve with Electric Actuators (Incl. Provision for Health & Safety Requirements)					
AS502100	Mobilisation and Enabling Works for NCSRSPS	0	31-Aug-16 A	09-Sep-16 A	
AS502120	Install Valves with Electric Actuators	0	10-Sep-16 A	23-Sep-16 A	
Modification of Control System					
Manufacturing, FAT and Delivery					
AS503100	Procument of Control System	0	19-Mar-16 A	01-Jun-16 A	
AS503120	Manufacturing, FAT & Delivery of Control System	0	02-Jun-16 A	22-Sep-16 A	
Install, T&C for Control System (Incl. Provision for Health & Safety Requirements)					
AS504100	Modification of Existing Pump Control System	0	17-Mar-17 A	11-May-17 A	
Associated Pipework and Fittings					
Manufacturing, FAT and Delivery					
AS505100	Procument of Associated Pipework and Fittings	0	28-Feb-16 A	01-Jun-16 A	
AS505120	Manufacturing, FAT & Delivery of Associated Pipework and Fittings	0	29-Mar-16 A	09-Sep-16 A	
Install, T&C for Associated Pipework & Fittings (Incl. Provision for Health & Safety Requirements)					
AS506100	Install Associated Pipework and Fittings	0	10-Sep-16 A	23-Sep-16 A	
AS506200a	Available of New Rising Main to Hung Leng SPS (By Others)	0		11-Apr-17 A	
AS506220a	Pipe connection to New Rising Main to Hung Leng SPS	0	01-Mar-17 A	27-Mar-17 A	
Commissioning of the Pumping System					
AS513100	Site Tests / Functional Test for level control and sensing equipment	0	12-Apr-17 A	11-May-17 A	
AS513110a	Further Coordination with DSD for Carrying Out Commissioning Test	0	12-May-17 A	05-Jun-17 A	
AS513120	Commission of the Pumping System	0	06-Jun-17 A	09-Jun-17 A	
AS513120a	Upload PLC Programme for Modified Pump Control System	0	28-Jul-17 A	28-Jul-17 A	



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