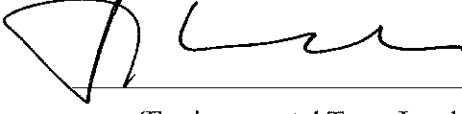


ASB Biodiesel (Hong Kong) Limited

Development of a Biodiesel Plant at Tseung Kwan O Industrial Estate

Quarterly EM&A Report
January – March 2018
(Version 1.0)

Certified By 
(Environmental Team Leader)

REMARKS:

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

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

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<i>To:</i>	Cinotech	<i>Date:</i>	26 July 2018
<i>Attn:</i>	Mr. H. T. Lai	<i>Fax:</i>	3107 1388
<i>From:</i>	Mr. Mark Cheung	<i>Ref:</i>	D1067/P06915
<i>Job No.</i>	D1067	<i>Total Pages:</i>	1

**Subject: Development of a Biodiesel Plant at Tseung Kwan O Industrial Estate
Quarterly EM&A Report (Jan - Mar 2018) v1.0**

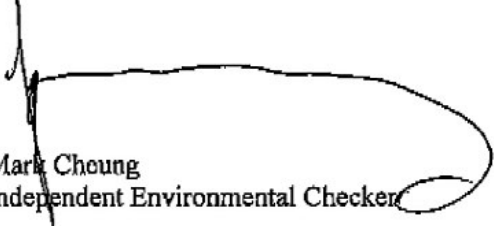
Dear Sir,

We refer to your submission of the Quarterly EM&A Report (Jan - Mar 2018) v1.0 via email dated 25 July 2018.

We write to advise that we have no comment on the captioned report.

Please compile the next quarterly EM&A report as soon as practicable.

Regards,



Mark Cheung
Independent Environmental Checker

KTC/gk

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EXECUTIVE SUMMARY

Introduction

1. This is the 8th quarterly Environmental Monitoring and Audit (EM&A) Report prepared by Cinotech Consultants Limited for Development of a Biodiesel Plant at Tseung Kwan O Industrial Estate in operational phase. This report documents the findings of EM&A works carried out in January – March 2018.

Environmental Licenses and Permits

2. Licenses/Permits granted to the Project include the followings:
 - Environmental Permit, EP-319/2009/D, granted on 28 January 2014;
 - Specified Process Licence, L-25-019(1), granted on 10 October 2013 &
 - Water Pollution Control Ordinance Licence, WT00029932-2017, granted on 22 December 2017.

Environmental Monitoring and Audit Works

3. Environmental monitoring and audit works for the Project were carried out in accordance with the criteria and requirements listed in the EM&A Manual, Environmental Permit, Specified Process Licence and Water Pollution Control Ordinance (WPCO) Licence granted. Monitoring results were checked and reviewed.
4. As there was limited biogas production in February and March 2018, emission from stack of biogas flare cannot be sampled. Therefore, monitoring on emission from the stack was suspended in February and March 2018, and will be resumed in April 2018.

Key Information in the Reporting Quarter

5. Summary of key information in this reporting quarter (January – March 2018) is listed in **Table I**.

Table I Summary of Key Information in January – March 2018

Event	Event Details		Action Taken	Status	Remark
	Number	Nature			
Exceedance of Action & Limit Levels	6	(1): Complaint about unpleasant malodour (2) & (3): Nitrogen oxides (NOx) emission from Stack of Boiler (4): Non-methanol organic Compound (NMOC) emission from Stack of Biogas Flare (5) & (6): Methanol emission from Stack of Process Building	Exceedance events were investigated and follow-up works have been carried out by the operator.	N/A	---
Complaint received	1	Complaint about unpleasant malodour	Event was investigated, and follow-up works have been carried out by the operator	Event was investigated, and follow-up works have been carried out by the operator	Follow-up works for 9 complaints are still on-going
Changes to the assumptions and key construction / operation activities recorded	0	---	N/A	N/A	---
Status of submissions under EP	3	(1): Monthly EM&A Report for Dec 2017 v1.0 (2): Monthly EM&A Report Jan 2018 v1.0 (3): Monthly EM&A Report Feb 2018 v1.0	Submitted to EPD on (1): 26 Jan 2018 (2): 26 Feb 2018 (3): 8 Mar 2018	Verified by IEC	---
Notifications of any summons & prosecutions	3	(1): Summons to defendant regarding the contravention of licence granted under the WPCO (2) & (3): Successful prosecution regarding the contravention of licence granted under the WPCO	N/A	N/A	---

1 INTRODUCTION

Background

- 1.1 ASB Biodiesel Plant (hereafter referred to as “the Plant”) was established in 2013 for the production of biodiesel and crude glycerine using cooking oil (UCO) and grease trap waste (GTW). The plant is located at Tseung Kwan O Industrial Estate (see **Figure 1.1** for the location plan of Project Site) and are able to produce 100,000 tonnes of low-carbon fuel per year for selling to both local and overseas market. The plant uses multi-feedstock which consists of UCO, oil and grease recovered from GTW, palm fatty acid distillate (PFAD) and animal fats. The plant offers a convenient recycling outlet for GTW and UCO, and converts oil and grease recovered from these wastes into useful products. The Project also offers a more environmental-friendly alternative to the diesel fuel market in Hong Kong.
- 1.2 This Project is a Designated Project under the Environmental Impact Assessment Ordinance (Cap. 499). An environmental impact assessment (EIA) was undertaken to identify and evaluate the impact on environment (e.g. air quality, noise, water quality and ecology), and propose possible measures to mitigate the impact. The EIA Report was approved by the Environmental Protection Department (EPD) on 26 February 2009.
- 1.3 Environmental Permit (EP) No. EP-319/2009 was issued on 11 March 2009 to ASB Biodiesel (Hong Kong) Limited as the Permit Holder. After several rounds of amendments, the latest version is EP No. EP-319/2009/D, which was issued on 28 January 2014.
- 1.4 Construction of the Plant has been completed since October 2013. After more than 2 years of commissioning trial, the Plant started to operate in April 2016. Cinotech Consultants Limited was commissioned by ASB Biodiesel (Hong Kong) Limited to undertake the Environmental Monitoring and Audit (EM&A) works for the Project. This is the 8th Quarterly EM&A report summarizing the EM&A works in operational phase for the Project in January – March 2018.

Project Organizations

- 1.5 Different parties with different levels of involvement in the project organization include:
- Project Proponent & Operator – ASB Biodiesel (Hong Kong) Limited
 - Independent Environmental Checker (IEC) – Mannings (Asia) Consultants Ltd
 - Environmental Team (ET) – Cinotech Consultants Limited
- 1.6 The responsibilities of respective parties are detailed in Section 2 of the Final EM&A Manual of the Project.
- 1.7 The key contacts of the Project are shown in **Table 1-1**.

Table 1-1 Key Project Contacts

Party	Role	Name	Position	Phone No.
ASB	Permit Holder & Operator	Mr. Andy Chan	EHS & Licensing Manager	3183 4202
		Mr. Nelson Tam	Engineer	3183 4315
Mannings	Independent Environmental Checker	Mr. Mark Cheung	Independent Environmental Checker	3168 2028
		Mr. Gavin Kwok	Assistant to Independent Environmental Checker	3970 8628
Cinotech	Environmental Team	Dr. HF Chan	ET Leader	2151 2088
		Ms. Betty Choi	Project Coordinator	2151 2072

Summary of EM&A Requirements

- 1.8 EM&A requirements for the Project include:
- Monitoring requirements as listed in the Project EM&A Manual;
 - Conditions listed in the Environmental Permit; &
 - Conditions listed in the SP License.

Status of Environmental Licensing and Permitting

- 1.9 All permits/licenses obtained for the Project are summarized in **Appendix A**.

2 ENVIRONMENTAL MONITORING REQUIREMENTS

Air Quality

- 2.1 According to Section 4.3 of the Final EM&A Manual of the Project, the emission from stacks of boiler, biogas flare and process building, and odour concentrations at the final air scrubber shall be monitored. Odour patrol along the Project Site boundary is also required. Detailed monitoring criteria (i.e. frequency, parameter, and action & limit levels) are listed in **Appendix B**. If limit levels are exceeded, the event and action plan as shown in **Appendix C** should be implemented.

Water Quality

- 2.2 According to Section 6.3 of the Final EM&A Manual of the Project, the water quality of treated effluent discharged from Project Site and stormwater discharge shall be monitored. Detailed monitoring criteria (i.e. frequency, parameter, and limit levels) are listed in **Appendix B**. If limit levels are exceeded, the event and action plan as shown in **Appendix C** should be implemented.

Sulphur Content in Bio Heating Oil

- 2.3 According to Section 3.11 of the EP-319/2009/D, if Bio Heating Oil (BHO) is used on site, the sulphur content in BHO shall be monitored. Monitoring criteria (i.e. frequency, parameter, and limit level) for the sulphur content in BHO are listed in **Appendix B**. If limit level is exceeded, the following actions should be taken by the ET:
- Inform Project Proponent and IEC within 24 hours;
 - Inform Project Proponent to increase the use of low sulphur diesel in the fuel tank(s) to achieve a fuel mixture with sulphur content of less than 346 ppm; and
 - Revert the monitoring programme to the original frequency of a test for every tank load of BHO, or at such a monitoring frequency to be advised and agreed by the EPD's Director.

3 MONITORING RESULTS

Air Quality

Emission from Stack of Boiler

- 3.1 Emission from stack of boiler was sampled and analyzed monthly. Monitoring results of emission from the stack of boiler in January – March 2018 are summarized in **Table 3-1** below and graphical presentation of results is shown in **Appendix D**.

Table 3-1 Monitoring Result of the Emission from the Stack of Boiler

Parameter	Limit Level	Monitoring Result *		
		Jan-18	Feb-18	Mar-18
Nitrogen oxides (NO _x)	2.213 kg/h	3.185 kg/h ***	2.525 kg/h ***	1.2 kg/h
Carbon monoxide (CO)	0.553 kg/h	< 0.2 kg/h	< 0.2 kg/h	< 0.2 kg/h
Sulphur dioxide (SO ₂)	0.797 kg/h	< 0.04 kg/h	< 0.05 kg/h	< 0.03 kg/h
Non-methane Organic Compounds (NMOC)	0.041 kg/h	0.0175 kg/h	0.0065 kg/h	0.0205 kg/h
Exhaust gas velocity	7 m/s **	17.64 m/s	18.14 m/s	12.625 m/s

* Average result of all trials is presented. If one of the data was smaller than the limit of reporting, the smallest recordable value was used for calculation of average.
** Minimum level should be achieved.
*** Exceedance of Limit Level

- 3.2 One and one exceedances of Limit Level were reported in January and February 2018 respectively. Investigation of the exceedance events were finished and measure was proposed for countering the exceedances.

Emission from Stack of Biogas Flare

- 3.3 Emission from stack of biogas flare was sampled and analyzed monthly. As there were limited biogas production in February and March 2018, emission from stack of biogas flare cannot be sampled. Therefore, monitoring on emission from the stack was suspended in February – March 2018, and will be resumed in April 2018. Summary of monitoring result of the emission from the stack of biogas flare in January 2018 is presented in **Table 3-2** below and graphical presentation of results is shown in **Appendix D**.

Table 3-2 Monitoring Result of the Emission from the Stack of Biogas Flare

Parameter	Limit Level	Monitoring Result *		
		Jan-18	Feb-18 ***	Mar-18 ***
Nitrogen oxides (NO _x)	0.053 kg/h	< 0.014 kg/h	-	-
Carbon monoxide (CO)	0.018 kg/h	< 0.021 kg/h ****	-	-
Sulphur dioxide (SO ₂)	0.039 kg/h	< 0.006 kg/h	-	-

Parameter	Limit Level	Monitoring Result *		
		Jan-18	Feb-18 ***	Mar-18 ***
Non-methane Organic Compounds (NMOC)	0.0018 kg/h	0.06385 kg/h *****	-	-
Exhaust gas velocity	0.54 m/s **	1.15 m/s	-	-

* Average result of all trials is presented. If one of the data was smaller than the limit of reporting, the smallest recordable value was used for calculation of average.
** Minimum level should be achieved.
*** Monitoring was suspended as there was limited biogas production.
**** As the emission is below reporting level, it is not considered as an exceedance event.
***** Exceedance of Limit Level.

3.4 One exceedance of Limit Level was reported in January 2018. Investigation of the exceedance event was finished and measure was proposed for countering the exceedance.

Emission from Stack of Process Building

3.5 Emission from stack of process building was sampled and analyzed monthly. Monitoring results of the emission from the stack of process building in January – March 2018 are summarized in **Table 3-3** below and graphical presentation of results is shown in **Appendix D**.

Table 3-3 Monitoring Result of the Emission from the Stack of Process Building

Parameter	Limit Level	Monitoring Result *		
		Jan-18	Feb-18	Mar-18
Acetyldehyde	0.0975 kg/h	< 0.001 kg/h	< 0.001 kg/h	< 0.001 kg/h
Methanol	0.0975 kg/h	0.02 kg/h	1.645 kg/h ***	0.125 kg/h ***
Exhaust gas velocity	0.79 m/s **	1.7 m/s	2.45 m/s	3.85 m/s

* Average result of all trials is presented. If one of the data was smaller than the limit of reporting, the smallest recordable value was used for calculation of average.
** Minimum level should be achieved.
*** Exceedance of Limit Level.

3.6 One and one exceedances of Limit Level were reported in February and March 2018 respectively. Investigation of the exceedance events were finished and measure was proposed for countering the exceedances.

Odour Concentration at the Final Air Scrubber

3.7 Odour Concentration at the final air scrubber was sampled and analyzed monthly. Summary of monitoring result of odour concentrations at the final air scrubber in January – March 2018 is presented in **Table 3-4** below and graphical presentation of results is shown in **Appendix D**.

Table 3-4 Monitoring Result of the Odour Concentrations at the Final Air Scrubber

Parameter	Limit Level	Monitoring Result *		
		Jan-18	Feb-18	Mar-18
Odour	200.3 OU/s	11.6 OU/s	10.8 OU/s	16.9 OU/s
Exhaust gas velocity	0.7 m/s **	0.95 m/s	0.8 m/s	0.7 m/s

* Average result of all trials is presented. If one of the data was smaller than the limit of reporting, the smallest recordable value was used for calculation of average.
** Minimum level should be achieved.

3.8 No exceedance of Limit Level was reported in January – March 2018.

Odour Patrols along Site Boundary

3.9 Odour intensity were monthly monitored by the odour patrols. Odour patrols were carried out by a qualified odour panelist in both morning and afternoon on 15 January, 5 February and 9 March 2018. Summary of monitoring result of odour patrols in January – March 2018 is presented in **Table 3-5** below and graphical presentation of results is shown in **Appendix D**.

Table 3-5 Monitoring Result of Odour Patrols along Site Boundary

Date	Odour Intensity		
	Action Level	Limit Level	Range of Measured Level
January 2018	Odour intensity \geq Class 2 recorded; or One documented complaint received	Odour intensity \geq Class 3 recorded on 2 consecutive patrols	0 – 1~2
February 2018			0 – 1~2
March 2018			0 – 1~2

3.10 1 exceedance of Action Level was reported in January 2018 as complaint regarding odour was received (see **Section 4**).

Water Quality

Water Quality of Treated Effluent Discharged from Project Site

3.11 Water quality of treated effluent discharged from Project Site was sampled and analyzed monthly. Summary of water quality monitoring result of treated effluent discharge from Project Site in January – March 2018 is presented in **Table 3-6** below and graphical presentation of results is shown in **Appendix E**.

Table 3-6 Water Quality Monitoring Result of Treated Effluent Discharged from Project Site

Parameter	Limit Level	Monitoring Result		
		Jan-18	Feb-18	Mar-18
pH	Within the range of 6-10	7.05	7.02	7.56
Suspended Solids	800 mg/L	320 mg/L	360 mg/L	80 mg/L
Biochemical Oxygen Demand (BOD) (5 days, 20°C)	800 mg/L	520 mg/L	650 mg/L	730 mg/L
Chemical Oxygen Demand (COD)	2000 mg/L	661 mg/L	820 mg/L	920 mg/L
Oil & Grease	50 mg/L	40 mg/L	40 mg/L	<10 mg/L
Sulphate	1000 mg/L	90 mg/L	110 mg/L	60 mg/L
Total Nitrogen	200 mg/L	60.4 mg/L	60 mg/L	56 mg/L
Total Phosphorus	50 mg/L	6.0 mg/L	14 mg/L	11.5 mg/L

3.12 No exceedance of Limit Level was reported in January – March 2018.

Water Quality of Stormwater Discharge

3.13 Water quality of stormwater discharge was sampled and analyzed quarterly. Summary of water quality monitoring result of stormwater discharge in January – March 2018 is presented in **Table 3-7** below and graphical presentation of results is shown in **Appendix E**.

Table 3-7 Water Quality Monitoring Result of Stormwater Discharge

Parameter	Limit Level	Monitoring Result		
		Jan-18	Feb-18	Mar-18
pH	Within the range of 6-9	--	--	6.91
Suspended Solids	50 mg/L	--	--	20 mg/L
Biochemical Oxygen Demand (BOD) (5 days, 20°C)	50 mg/L	--	--	40 mg/L
Chemical Oxygen Demand (COD)	100 mg/L	--	--	82 mg/L
Oil & Grease	30 mg/L	--	--	<10 mg/L

* Water quality of stormwater discharge from Project Site was sampled and analyzed quarterly

3.14 No exceedance of Limit Level was reported in January – March 2018.

Sulphur Content in Bio Heating Oil

- 3.15 Sulphur content in bio heating oil was sampled and analyzed. Summary of monitoring result of Sulphur content in bio heating oil in January – March 2018 is presented in **Table 3-8** below and graphical presentation of results is shown in **Appendix F**.

Table 3-8 Monitoring Result of Sulphur Content in Bio Heating Oil

Parameter	Limit Level	Monitoring Result		
		Jan-18	Feb-18	Mar-18
Sulphur Content	346 ppm	313 ppm	298 ppm	335 ppm

- 3.16 No exceedance of Limit Level was reported in January – March 2018.

Summary of Exceedance Events in the Reporting Quarter

- 3.17 A summary of all exceedance events is presented in **Table 3-9** below. Investigation report for the exceedance events in January – March 2018 are attached in the Monthly EM&A Reports (January – March 2018) respectively. Details for the exceedance event due to complaints can be found in **Appendix H**.

Table 3-9 Summary of Exceedance Events in the Reporting Quarter

Parameter		Unit	Action Level	Limit Level	Monitoring Result
January 2018					
Stack of Boiler (EP2)	Nitrogen oxides (NO _x)	kg/h	- *	2.213	3.185
Stack of Biogas Flare (EP1)	Non-methane Organic Compounds (NMOC)	kg/h	- *	0.0018	0.06385
Odour Patrol	Odour Intensity	-	Odour intensity ≥Class 2 recorded; or One documented complaint received	Odour intensity ≥Class 3 recorded on 2 consecutive patrols	One documented complaint received
February 2018					
Stack of Boiler (EP2)	Nitrogen oxides (NO _x)	kg/h	- *	2.213	2.525
Stack of Process Building (EP3)	Methanol	kg/hr	- *	0.0975	1.645
March 2018					
Stack of Process Building (EP3)	Methanol	kg/hr	- *	0.0975	0.125
* No action level was set in the Final EM&A Manual of the Project, Environmental Permit, and in the Specified Process Licence					

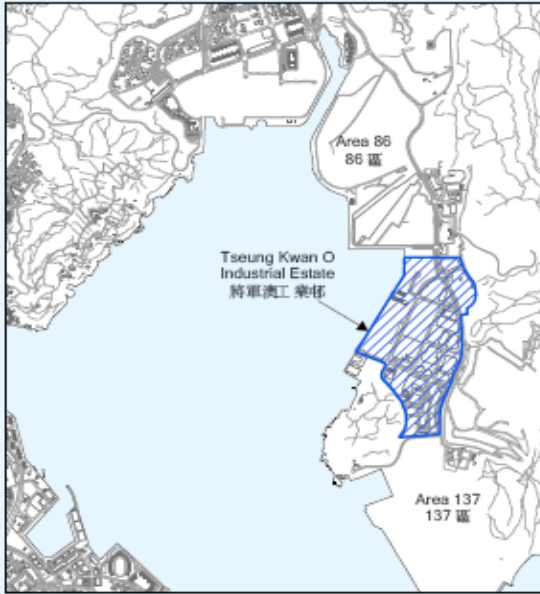
4 SUMMARY OF COMPLAINT AND PROSECUTION

- 4.1 1 environmental related complaint was received in January 2018 (see **Appendix H**).
- 4.2 In total, 1 notification of summons regarding the contravention of the WPCO licence (WT00022972-2015) was received in the reporting quarter. 1 and 1 successful prosecutions regarding the contravention of the WPCO licence (WT00022972-2015) were received in January and February respectively.
- 4.3 There were 15 environmental complaints, 4 notification of summons, and 4 successful prosecutions received since the commencement of Project (operational phase). The Complaint Log is attached in **Appendix H**.

5 CONCLUSIONS

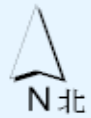
- 5.1 In January – March 2018, environmental monitoring and audit works were carried out in accordance with criteria and requirements listed in the Project EM&A Manual, Environmental Permit EP-319/2009D, Specified Process Licence L-25-019(1) and Water Pollution Control Ordinance Licence WT00029932-2017.
- 5.2 Monitoring of air quality, water quality and sulphur content in Bio Heating Oil were carried out at designated locations. In the reporting quarter, 2, 1 and 2 exceedances of Limit Level were recorded at the Stack of Boiler, Stack of Biogas Flare and Stack of Process Building respectively. In addition, 1 Action Level exceedance was recorded due to the complaints received on 29th January 2018. Investigation reports / complaint log for the events are attached in the Monthly EM&A Reports (January – March 2018) respectively.
- 5.3 As there was limited biogas production in February and March 2018, emission from stack of biogas flare cannot be sampled. Therefore, monitoring on emission from the stack was suspended in February – March 2018, and will be resumed in April 2018.
- 5.4 In the reporting quarter, 1 environmental related complaint, with 1 notification of summons and 2 successful prosecutions were received.

FIGURES



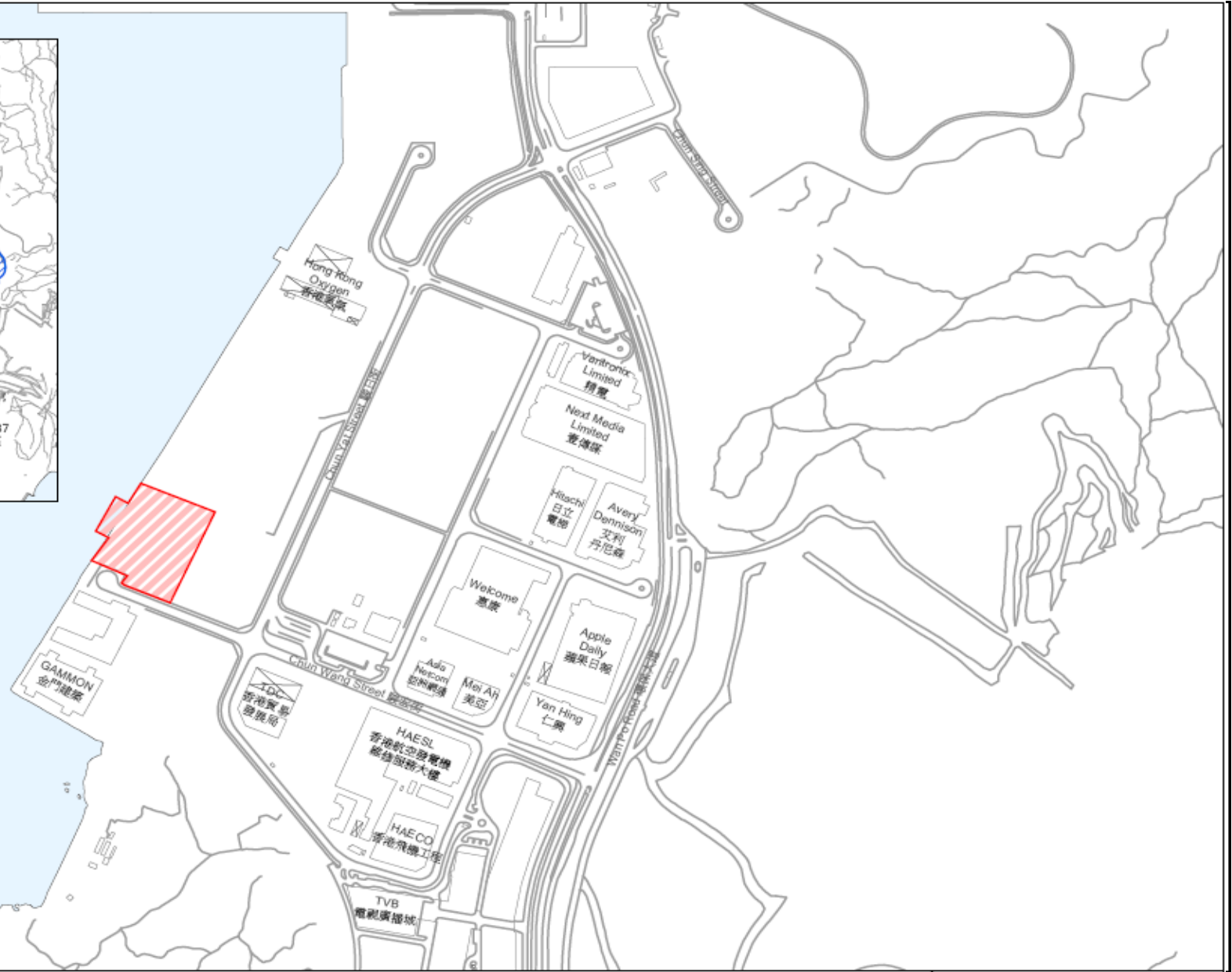
Key 圖例

 Proposed Site



Meters 米

0 100 200 400



Title Development of a Biodiesel Plant at Tseung Kwan O Industrial Estate

Location Plan

Scale

N.T.S

Date

MAY 2016

Project

No. MA15052

Figure

1.1

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APPENDIX A
Summary of Environmental Licensing and
Permit Status

Appendix A Summary of Environmental Licensing and Permit Status

Permit / License No.	Valid Period		Summary	Status
	From	To		
Environmental Permit (EP)				
EP-319/2009/D	28/01/2014	N/A	Operation of <ul style="list-style-type: none"> • a biochemical plant with a storage capacity of more than 500 tonnes and in which substances are processed and produced; • a storage, transfer and transhipment of oil facility with a storage capacity of not less than 1,000 tonnes; and • a dangerous goods godown with a storage capacity exceeding 500 tonnes 	Valid
Specified Process (SP) Licence				
L-25-019(1)	10/10/2013	10/10/2015	<ul style="list-style-type: none"> • Emission of non-fugitive fixed point emissions 	Under renewal
Water Pollution Control Ordinance (WPCO) Licence				
WT00029932-2017	22/12/2017	31/12/2019	Discharge of <ul style="list-style-type: none"> • effluent from wastewater treatment facilities to communal foul sewer; and • effluent from floor washing of operation areas to communal storm drain 	Valid
WT00022972-2015	16/12/2015	31/12/2017	Discharge of <ul style="list-style-type: none"> • effluent from wastewater treatment facilities to communal foul sewer; and • effluent from floor washing of operation areas to communal storm drain 	Expired on 31/12/2017

APPENDIX B
Summary of Monitoring Criteria

Appendix B Summary of Monitoring Criteria

Air Quality				
	Frequency	Parameter	Action Levels	Limit Levels
Emission from Stack of Boiler (EP2)	Monthly for the first 12 months of operation. If the monitoring results of the first year monitoring meet the limit level, the monitoring will be reduced to half-yearly intervals for the whole operational stage. *	Nitrogen oxides (NO _x)	– **	2.213 kg/h
Emission from Stack of Biogas Flare (EP1)		Carbon monoxide (CO)		0.553 kg/h
Emission from Stack of Process Building (EP3)		Sulphur dioxide (SO ₂)		0.797 kg/h
		Non-methane Organic Compounds (NMOC)		0.041 kg/h
		Exhaust gas velocity		7 m/s (minimum)
		NO _x	– **	0.053 kg/h
		CO		0.018 kg/h
		SO ₂		0.039 kg/h
		NMOC		0.0018 kg/h
		Exhaust gas velocity		0.54 m/s (minimum)
		Acetyldehyde	– **	0.0975 kg/h
		Methanol		0.0975 kg/h
		Exhaust gas velocity		0.79 m/s (minimum)
Odour Concentrations at the Final Air Scrubber (EP5)	Monthly for the first 2 years of operation *	Odour	– **	200.3 OU/s
		Exhaust gas velocity		0.7 m/s (minimum)
Odour Patrols along the Project Site Boundary	<p>Two times a day, one in the morning and one in the afternoon</p> <ul style="list-style-type: none"> Monthly for the first 12 months of operation. If the monitoring results of the first year monitoring meet the limit level, the monitoring frequency will be reduced to quarterly intervals in the second year; If the action level is triggered during the second year of operation, the frequency will be resumed to monthly intervals until compliance with the action level for three consecutive months is obtained; If the action level is not triggered for four consecutive quarterly monitoring, the monitoring can be terminated. 	Odour Intensity	<ul style="list-style-type: none"> Odour intensity \geq Class 2 recorded; or One documented complaint received 	<ul style="list-style-type: none"> Odour intensity \geq Class 3 recorded on 2 consecutive patrols
<p>* Monitoring will not be carried out during raining days</p> <p>** No action level is set in the Final EM&A Manual of the Project and in the Specified Process Licence</p>				

Appendix B Summary of Monitoring Criteria

Water Quality			
Discharge	Frequency	Parameter	Limit Levels
Treated Effluent Discharged from Project Site	Monthly	pH	Within the range of 6 - 10
		Suspended Solids	800 mg/L
		Biochemical Oxygen Demand (BOD) (5 days, 20 °C)	800 mg/L
		Chemical Oxygen Demand (COD)	2000 mg/L
		Oil & Grease	50 mg/L
		Sulphate	1000 mg/L
		Total Nitrogen	200 mg/L
		Total Phosphorus	50 mg/L
Stormwater Discharge	Quarterly	pH	Within the range of 6 – 9
		Suspended Solids	50 mg/L
		Biochemical Oxygen Demand (BOD) (5 days, 20 °C)	50 mg/L
		Chemical Oxygen Demand (COD)	100 mg/L
		Oil & Grease	30 mg/L
* No action level was set in the WPCO Licence			

Appendix B Summary of Monitoring Criteria

Sulphur Content in Bio Heating Oil		
Frequency	Parameter	Limit Levels
<p>Every tank load of the BHO for the BHO's sulphur content when the fuel tank(s) is being filled/refilled</p> <ul style="list-style-type: none"> • This original frequency shall be adopted in the first three months of using BHO on site. After the first three months of the original monitoring regime, if all monitoring result in the first three months meet the limit level, the frequency may be reduced to one test for every two refills for the next three months; and after the first six months, the monitoring may be conducted once a month. • If exceedance occur, the monitoring shall be reverted to the original frequency of a test for every tank load of BHO, or at such a monitoring frequency to be advised and agreed by the EPD's Director. 	Sulphur Content	346 ppm
* No action level was set in the EP of the Project		

APPENDIX C
Event and Action Plan

Appendix C Event and Action Plan

Air Quality			
Event	Actions		
	ET Leader	IEC	Project Proponent
Exceedance of Limit Level for stack emission from boiler, biogas flare, process building and final air scrubber	<ul style="list-style-type: none"> • Inform Project Proponent and IEC, and investigate and record the cause of exceedance within 24 hours • Repeat measurement to confirm finding • Identify source(s) and investigate the cause(s) of exceedance • Inform Project Proponent whether the cause of exceedance is due to the Project • Prepare the Notification of Exceedance within 24 hours • Discuss remedial actions with the Project Proponent • Assess the effectiveness of Project Proponent's remedial actions • For the monitoring of emissions from the stacks of the boiler, biogas flare and process building, increase the monitoring frequency from half-yearly (for the second year onward) to monthly intervals. If results of three consecutive monthly monitoring show no exceedance of the limit level, the monitoring frequency will be reverted back to half-yearly intervals. 	<ul style="list-style-type: none"> • Verify the Notification of Exceedance submitted by the ET Leader • Check with the Project Proponent on the operating activities and implementation of control measures • Discuss with ET Leader and Project Proponent on the possible remedial actions • Advise the Project Proponent on the effectiveness of the proposed remedial measures • Supervise implementation of remedial measures 	<ul style="list-style-type: none"> • Rectify any unacceptable practice • Amend working methods as required • Implement amended working methods, if necessary
Exceedance of Action Level for odour	<ul style="list-style-type: none"> • Inform Project Proponent and IEC, and investigate and record the cause of exceedance within 24 hours • Repeat measurement to confirm finding • Identify source(s) / reason of exceedance or complain • Prepare the odour complain form or the Notification of Exceedance within 24 hours • Inform Project Proponent whether the cause of exceedance is due to the Project • Discuss remedial actions with the Project Proponent • During the second year of operation, if the action level is triggered, the frequency will be resumed to monthly until compliance with the action level for three consecutive months is obtained and the frequency will be reduced to quarterly intervals thereafter. 	<ul style="list-style-type: none"> • Verify the Notification of Exceedance submitted by the ET Leader 	<ul style="list-style-type: none"> • Rectify any unacceptable practice • Amend working methods as required • Implement amended working methods, if necessary

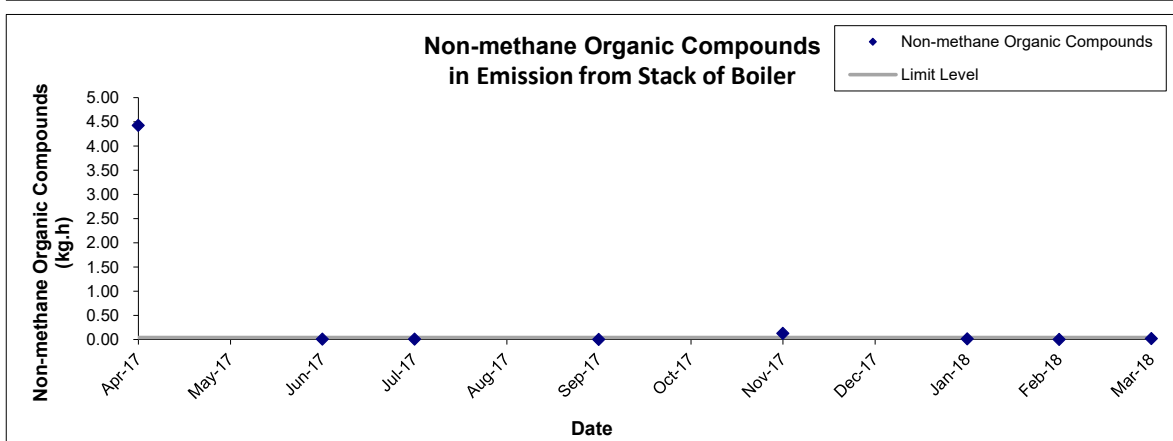
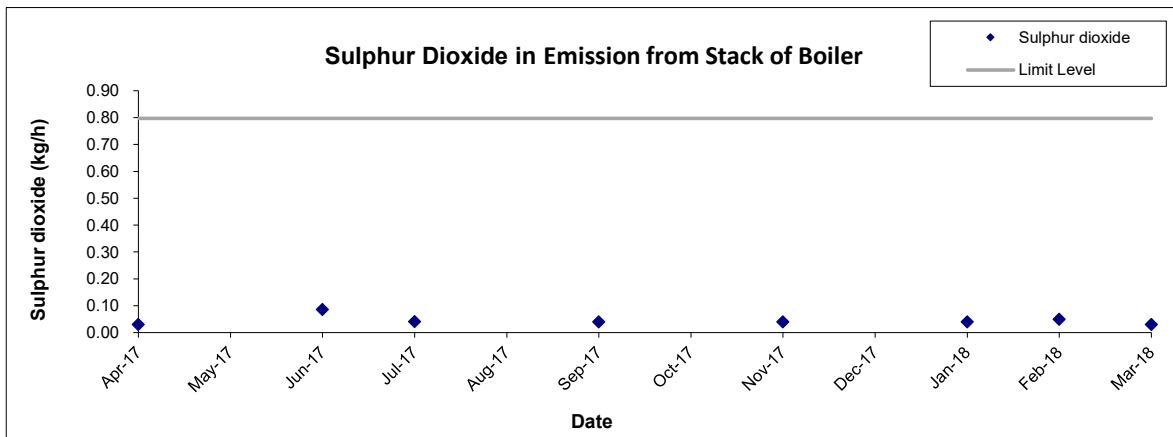
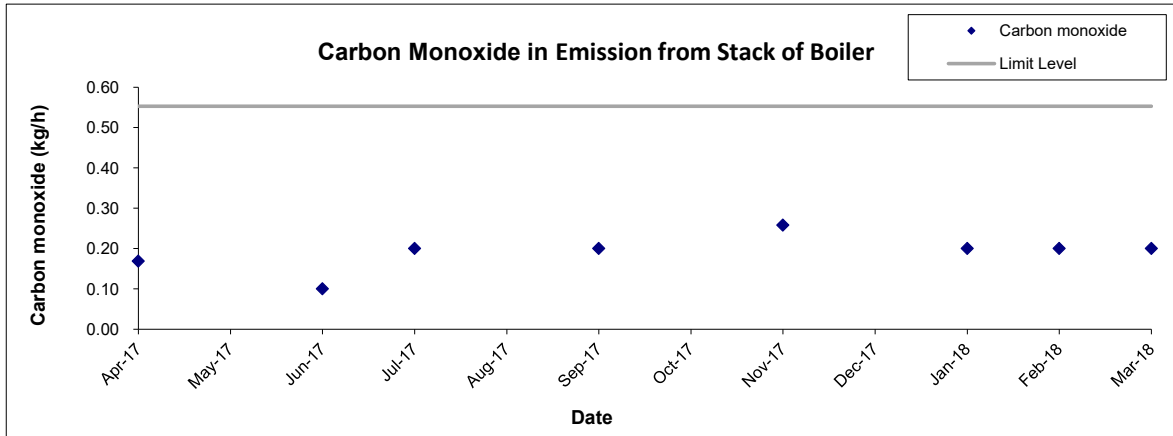
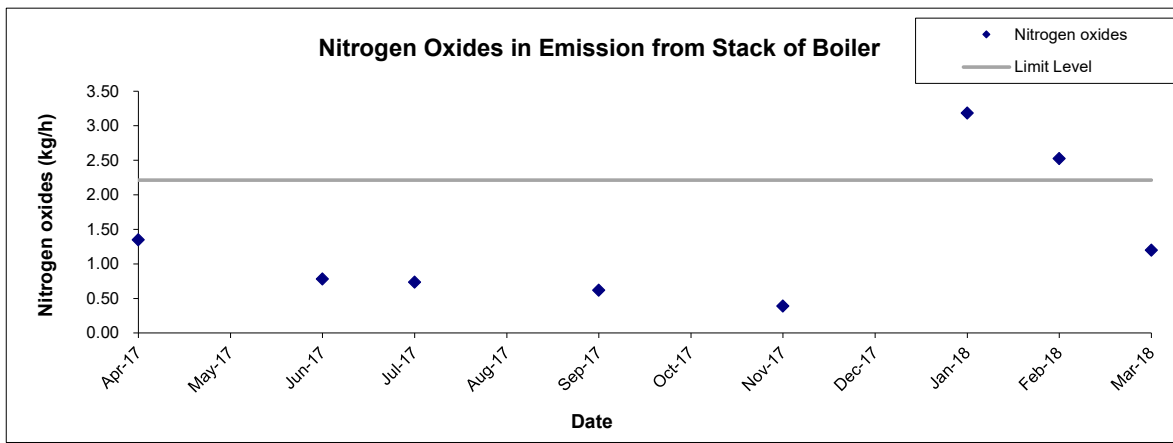
Appendix C Event and Action Plan

<p>Exceedance of Limit Level for odour</p>	<ul style="list-style-type: none"> • Inform Project Proponent and IEC, and investigate and record the cause of exceedance within 24 hours • Repeat measurement to confirm finding • Identify source(s) / reason of exceedance or complain • Prepare the odour complain form or the Notification of Exceedance within 24 hours • Inform Project Proponent whether the cause of exceedance is due to the Project • Assess the effectiveness of Project Proponent's remedial actions or amended design 	<ul style="list-style-type: none"> • Verify the Notification of Exceedance submitted by the ET Leader • Check with the Project Proponent on the operating activities and implementation of control measures • Discuss with ET Leader and Project Proponent on the possible remedial actions • Advise the Project Proponent on the effectiveness of the proposed remedial measures • Supervise implementation of remedial measures 	<ul style="list-style-type: none"> • Rectify any unacceptable practice • Propose and implement remedial measures or amend design as required within 3 working days of notification • Resubmit proposals if problem still not under control
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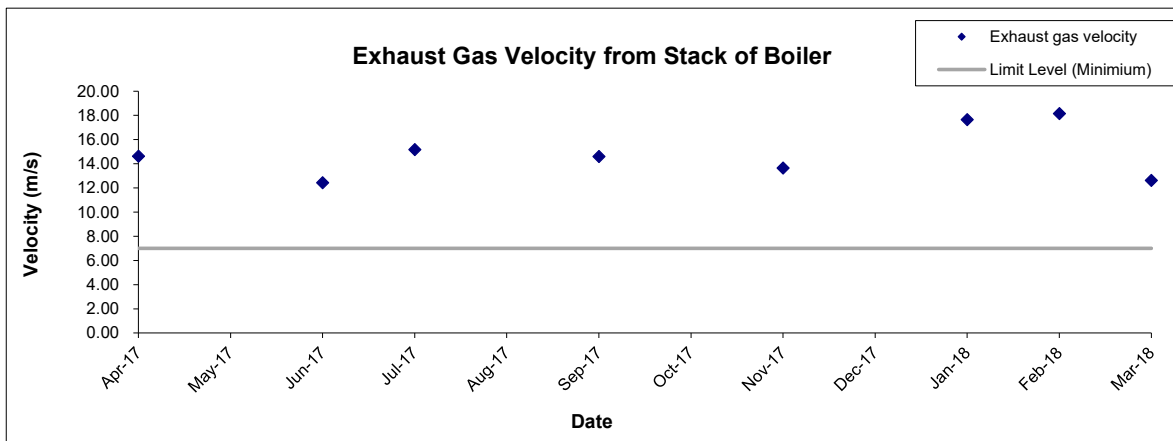
Appendix C Event and Action Plan

Water Quality			
Event	Actions		
	ET Leader	IEC	Project Proponent
Exceedance of Limit Level for Treated Effluent Discharged from Project Site	<ul style="list-style-type: none"> • Inform Project Proponent and IEC, and investigate and record the cause of exceedance within 24 hours • Repeat measurement to confirm finding • Identify source(s) and investigate the cause(s) of exceedance • Prepare the Notification of Exceedance within 24 hours • Discuss remedial actions with the Project Proponent • Assess the effectiveness of Project Proponent's remedial actions 	<ul style="list-style-type: none"> • Verify the Notification of Exceedance submitted by the ET Leader • Check with Contractor on the operating activities and implementation of landfill gas control measures • Discuss with ET Leader and Contractor on the possible remedial actions • Advise the IC on the effectiveness of the proposed remedial measures • Supervise implementation of remedial measures 	<ul style="list-style-type: none"> • Check the performance of the on-site WWTP • Rectify any unacceptable performance • Carry out remedial measures or amend design as required • Implement amended design, if necessary
Exceedance of Limit Level for Stormwater Discharged from the Project Site	<ul style="list-style-type: none"> • Inform Project Proponent and IEC, and investigate and record the cause of exceedance within 24 hours • Repeat measurement to confirm finding • Identify source(s) and investigate the cause(s) of exceedance • Prepare the Notification of Exceedance within 24 hours • Discuss remedial actions with the Project Proponent • Assess the effectiveness of Project Proponent's remedial actions 	<ul style="list-style-type: none"> • Verify the Notification of Exceedance submitted by the ET Leader • Check with Project Proponent on the operating activities • Discuss with ET Leader and Project Proponent on the possible remedial actions • Advise the Project Proponent on the effectiveness of the proposed remedial measures • Supervise implementation of remedial measures 	<ul style="list-style-type: none"> • Propose and implement remedial measures or amend design as required • Rectify any unacceptable practice • Amend working methods as required • Implement amended working methods, if necessary

APPENDIX D
Graphical Presentation of Monitoring
Results – Air Quality

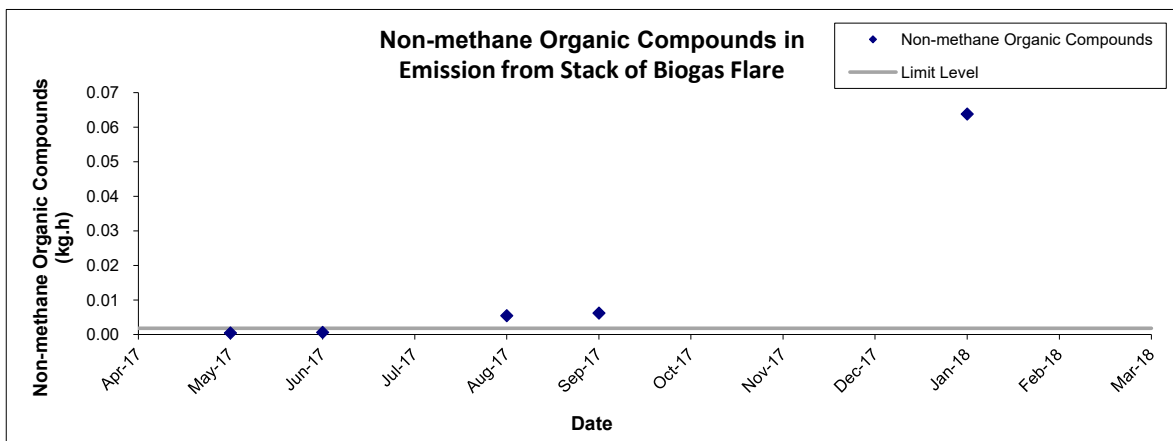
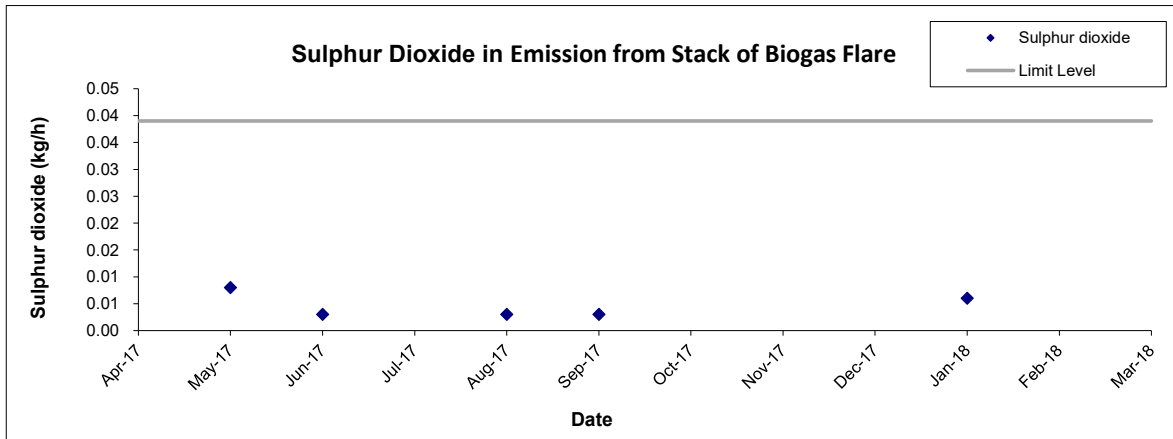
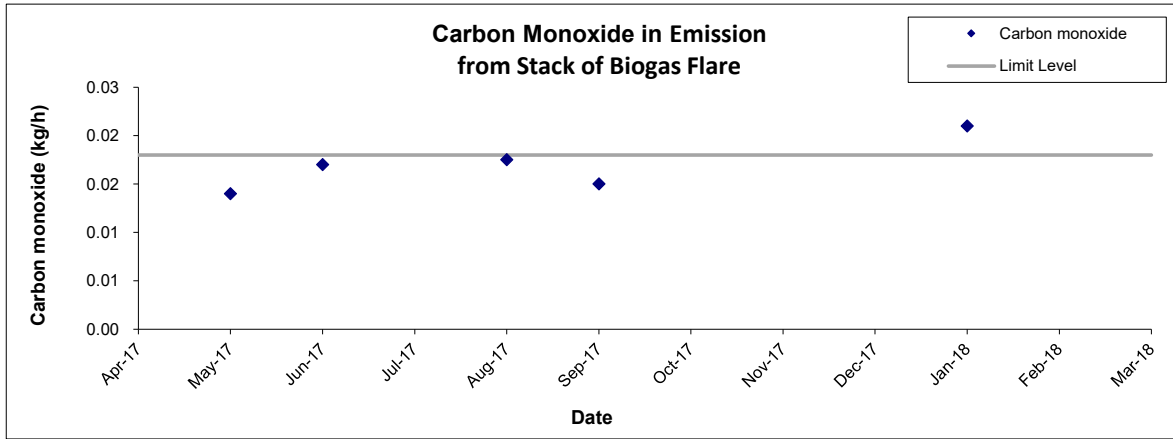
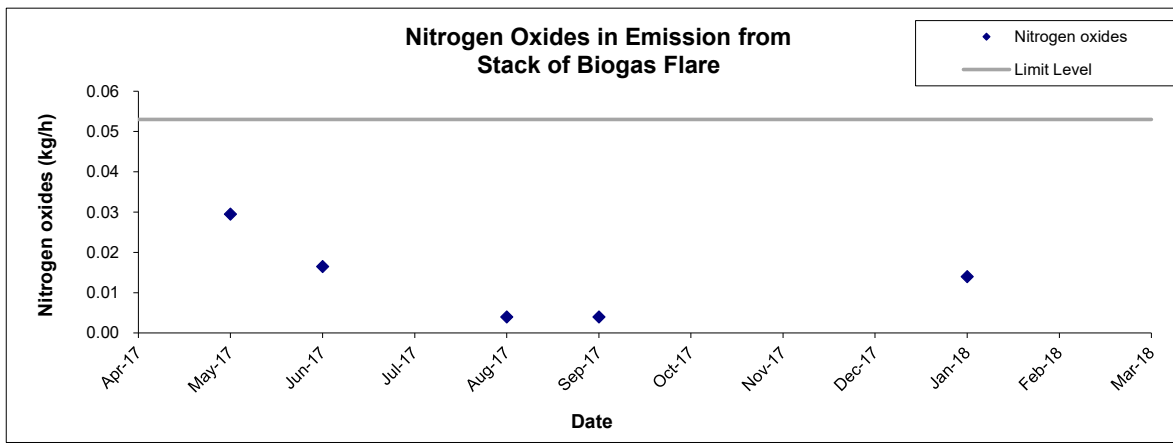


Title Development of a Biodiesel Plant at Tseung Kwan O Industrial Estate Graphical Presentation of Monitoring Results – Air Quality (Emission from Stack of Boiler)	Scale	N.T.S	Project No.	MA15052	CINOTECH
	Date	Mar 18	Appendix	D-1	

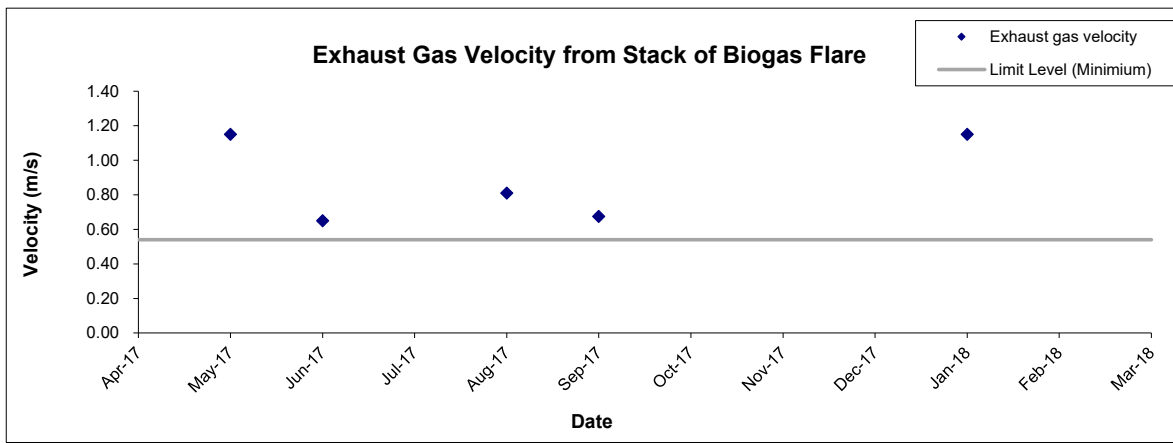


Remark: As the boiler was under maintenance in May 2017, emission from stack of boiler cannot be sampled.
 As maintenance work is required after Typhoon Hato, emission from stack of boiler in August 2017 cannot be sampled.
 As there was limited production in October 2017, emission from stacks of boiler, biogas flare and process building cannot be sampled.
 As there was limited production in December 2017, emission from stacks of boiler, biogas flare and process building cannot be sampled.

Title Development of a Biodiesel Plant at Tseung Kwan O Industrial Estate Graphical Presentation of Monitoring Results – Air Quality (Emission from Stack of Boiler)	Scale N.T.S	Project No. MA15052	
	Date Mar 18	Appendix D-2	

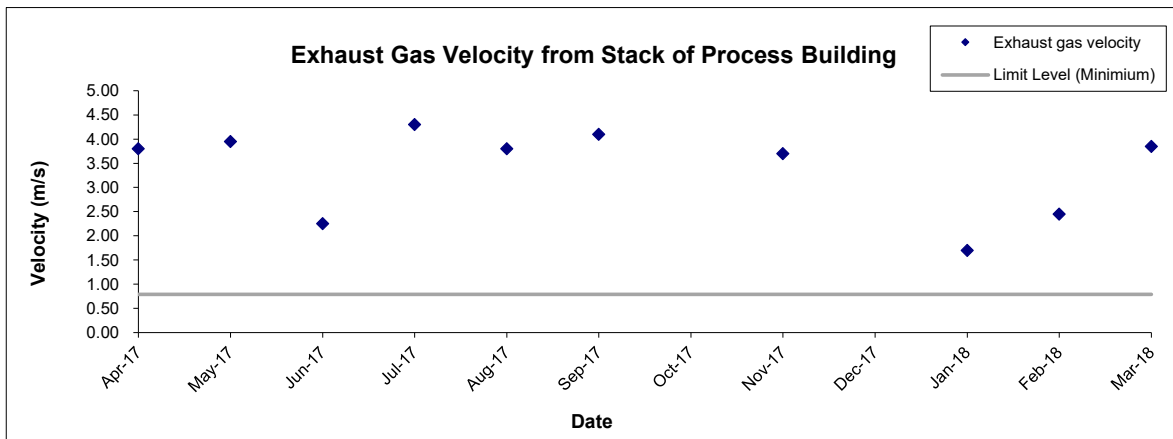
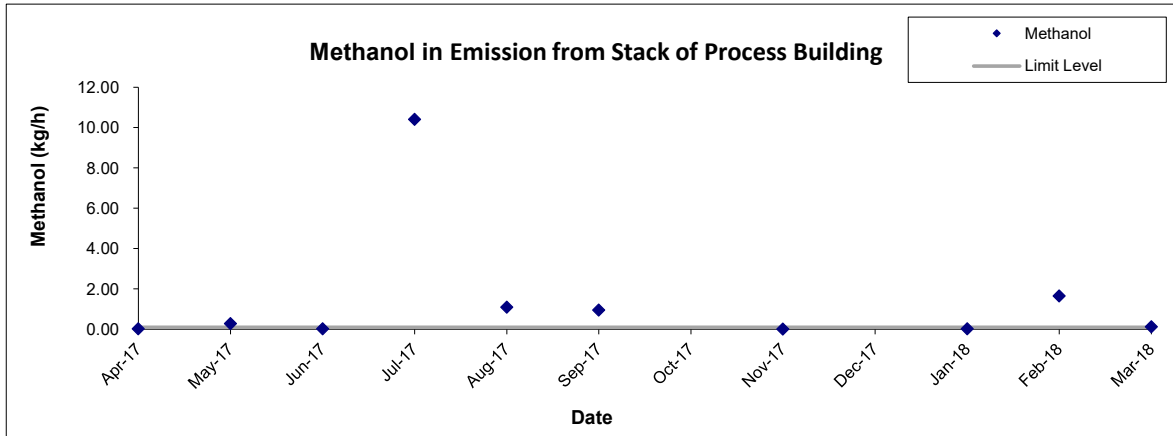
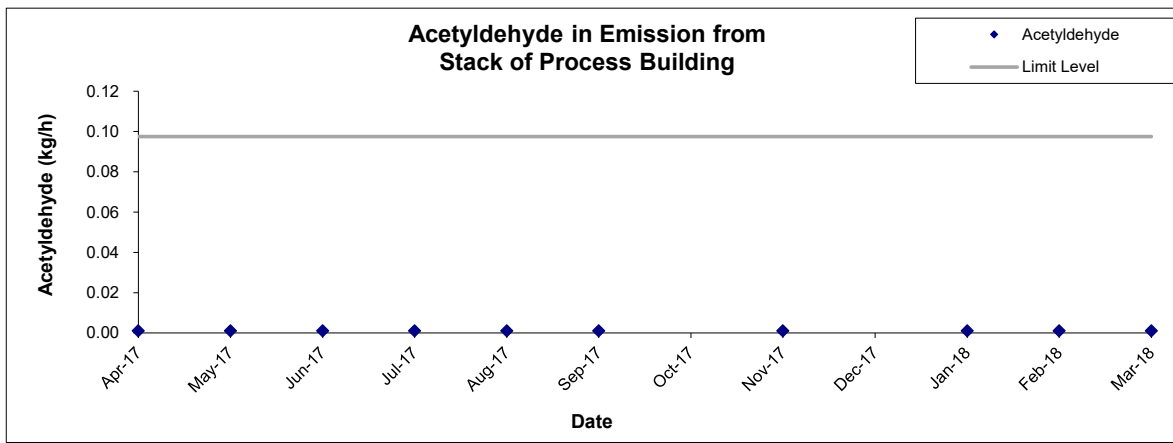


Title Development of a Biodiesel Plant at Tseung Kwan O Industrial Estate Graphical Presentation of Monitoring Results – Air Quality (Emission from Stack of Biogas Flare)	Scale	N.T.S	Project No. MA15052	CINOTECH
	Date	Mar 18	Appendix D-3	



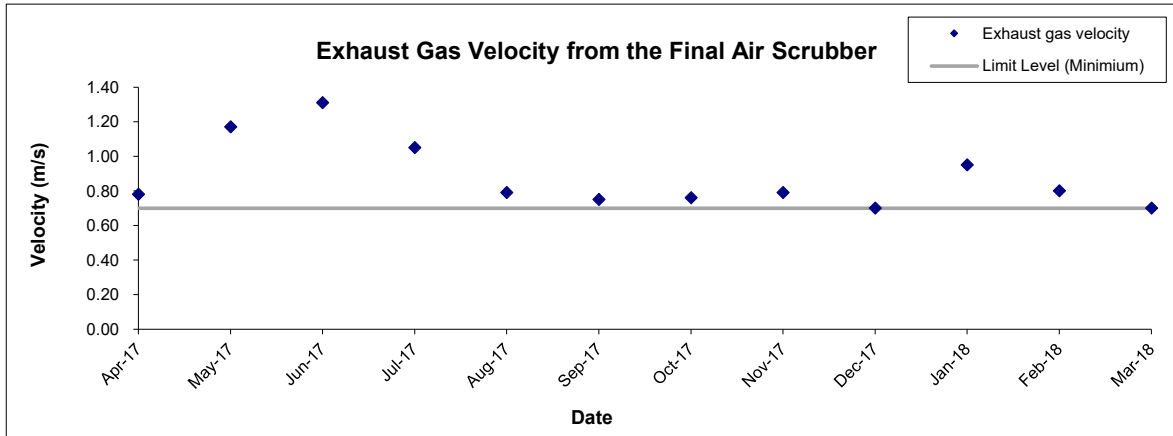
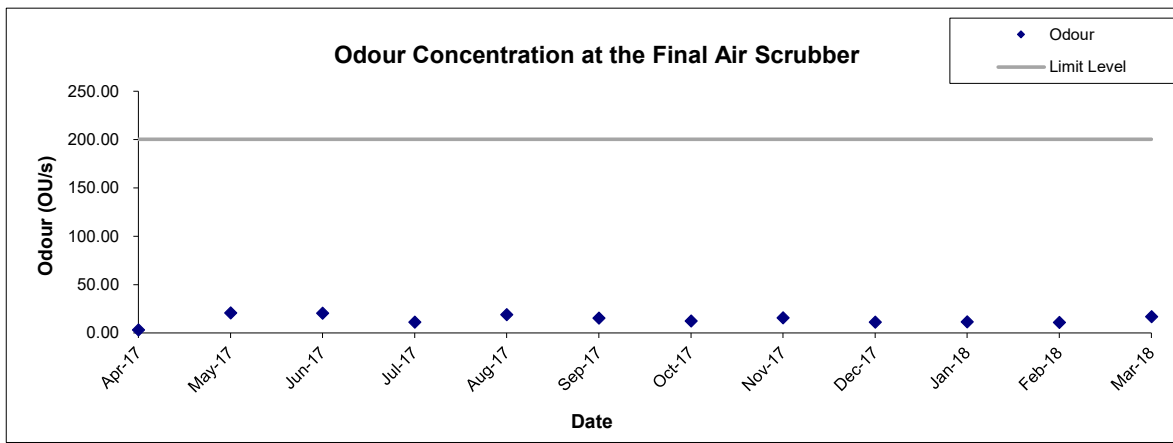
Remark: As there was limited biogas production in April 2017, emission from stack of biogas flare cannot be sampled.
 As the wastewater treatment plant is under maintenance (no biogas was generated) in July 2017, emission from stack of biogas flare cannot be sampled.
 As there was limited production in October 2017, emission from stacks of boiler, biogas flare and process building cannot be sampled.
 As there was limited biogas production in November 2017, emission from stack of biogas flare cannot be sampled.
 As there was limited production in December 2017, emission from stacks of boiler, biogas flare and process building cannot be sampled.
 As there was limited biogas production in February and March 2018, emission from stack of biogas flare cannot be sampled.

Title Development of a Biodiesel Plant at Tseung Kwan O Industrial Estate Graphical Presentation of Monitoring Results – Air Quality (Emission from Stack of Biogas Flare)	Scale N.T.S	Project No. MA15052	
	Date Mar 18	Appendix D-4	

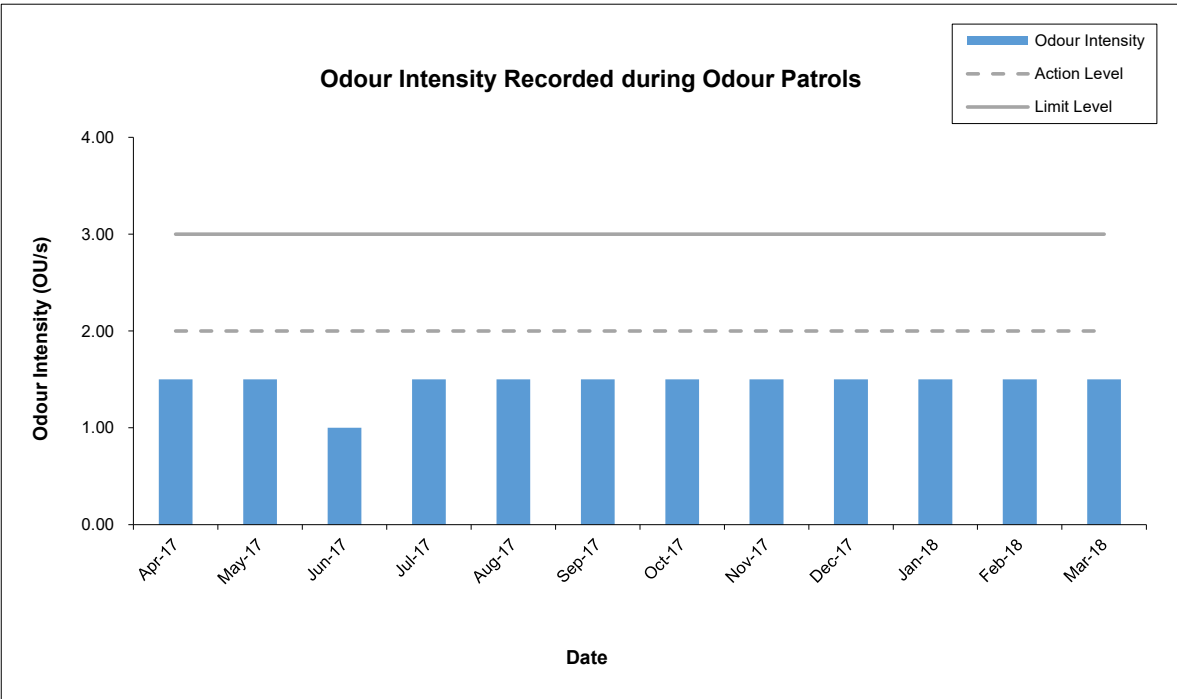


Remark: As there was limited production in October 2017, emission from stacks of boiler, biogas flare and process building cannot be sampled.
 As there was limited production in December 2017, emission from stacks of boiler, biogas flare and process building cannot be sampled.

Title Development of a Biodiesel Plant at Tseung Kwan O Industrial Estate Graphical Presentation of Monitoring Results – Air Quality (Emission from Stack of Process Building)	Scale	N.T.S	Project No. MA15052	CINOTECH
	Date	Mar 18	Appendix D-5	

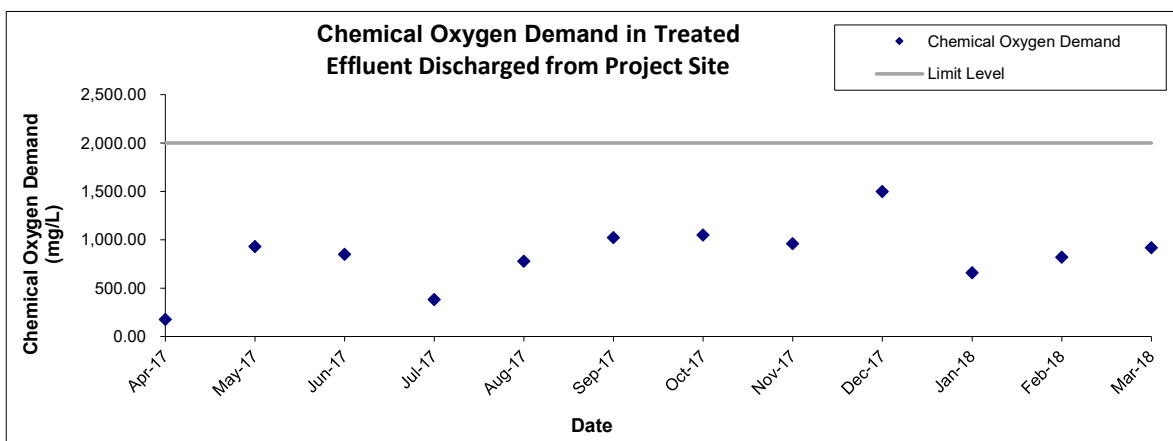
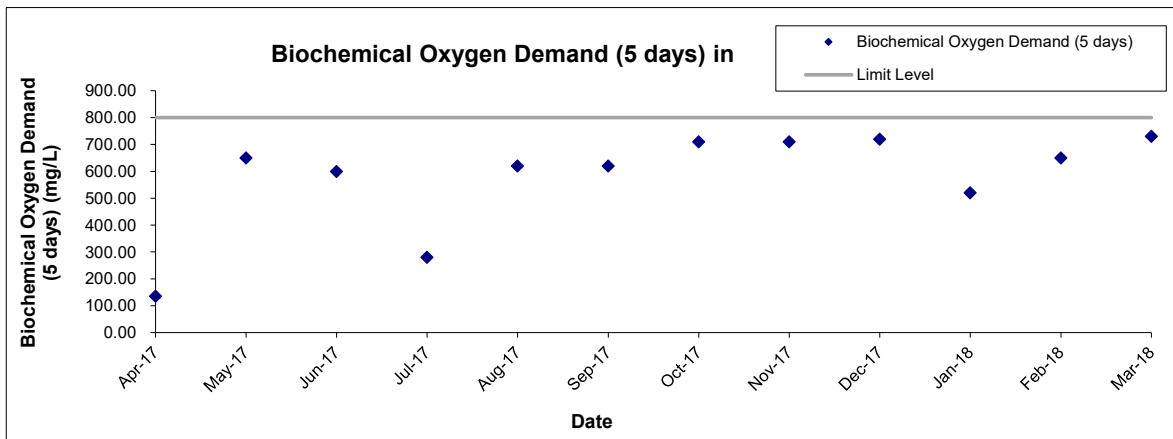
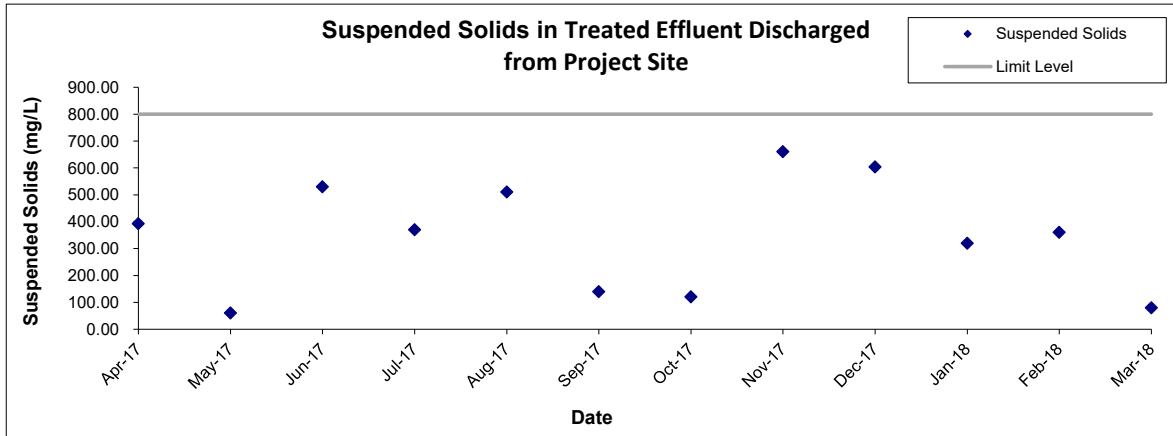
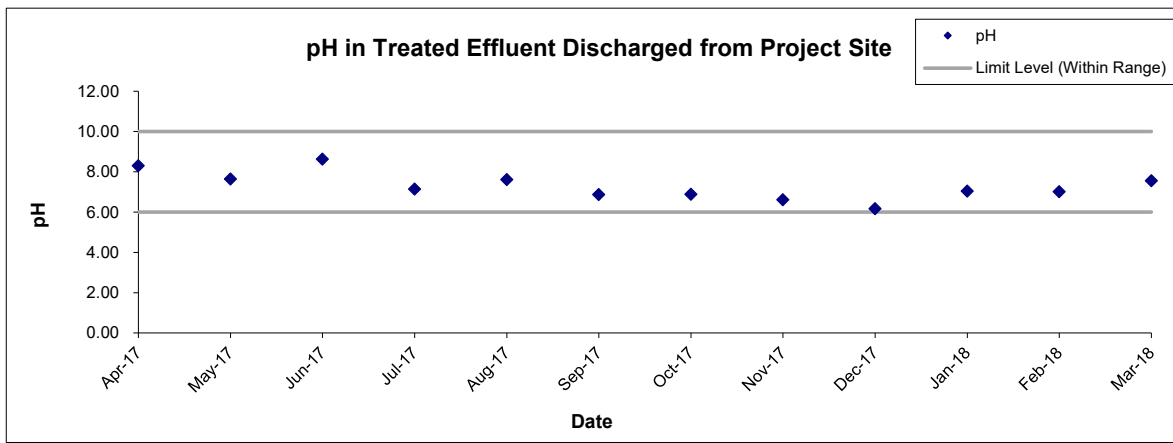


Title Development of a Biodiesel Plant at Tseung Kwan O Industrial Estate Graphical Presentation of Monitoring Results – Air Quality (Odour Concentration at the Final Air Scrubber)	Scale	N.T.S	Project No. MA15052	CINOTECH
	Date	Mar 18	Appendix D-6	

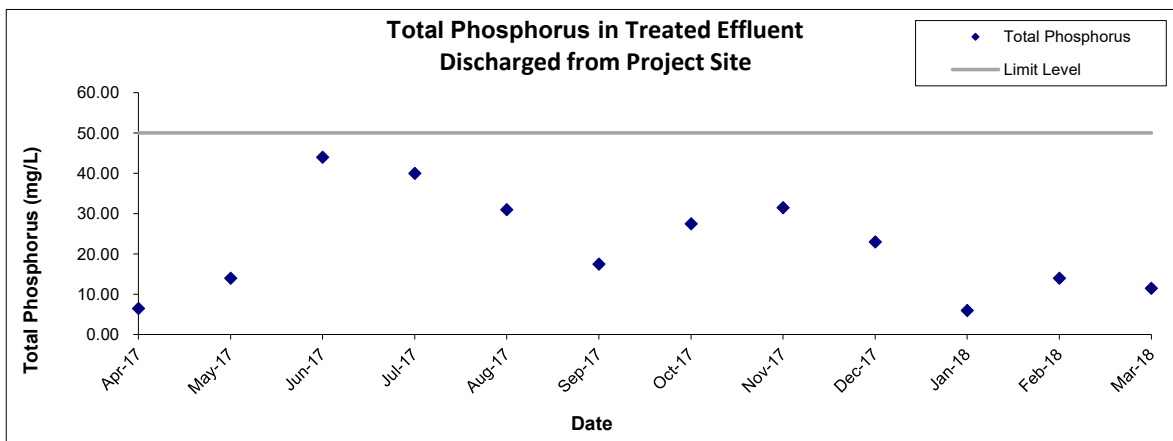
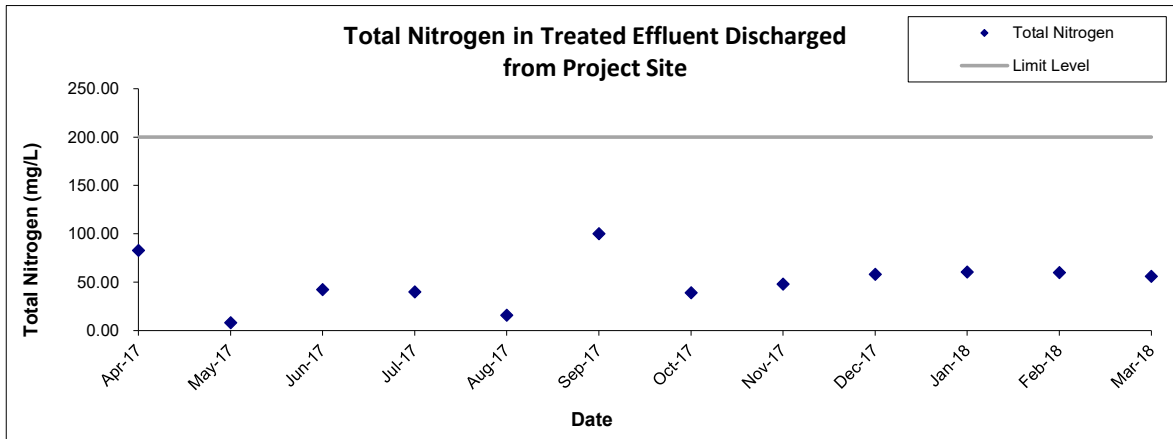
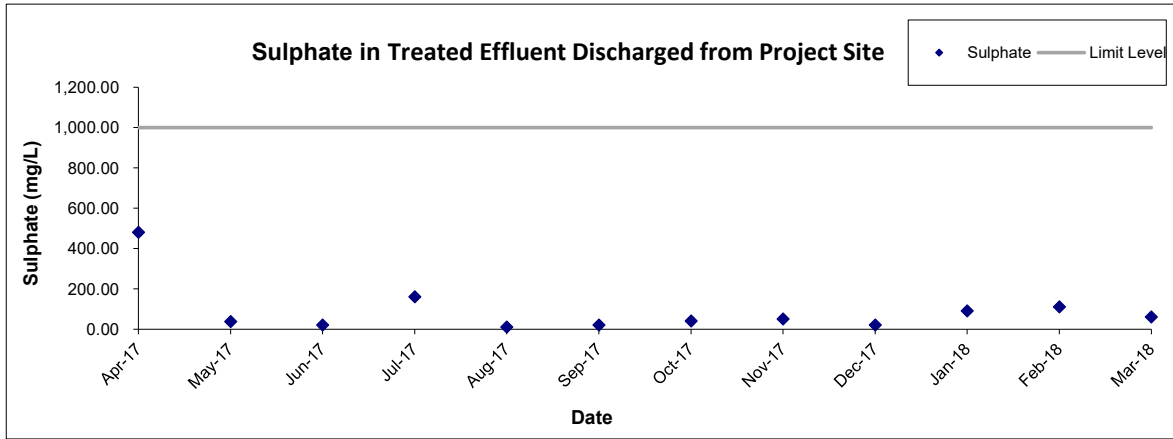
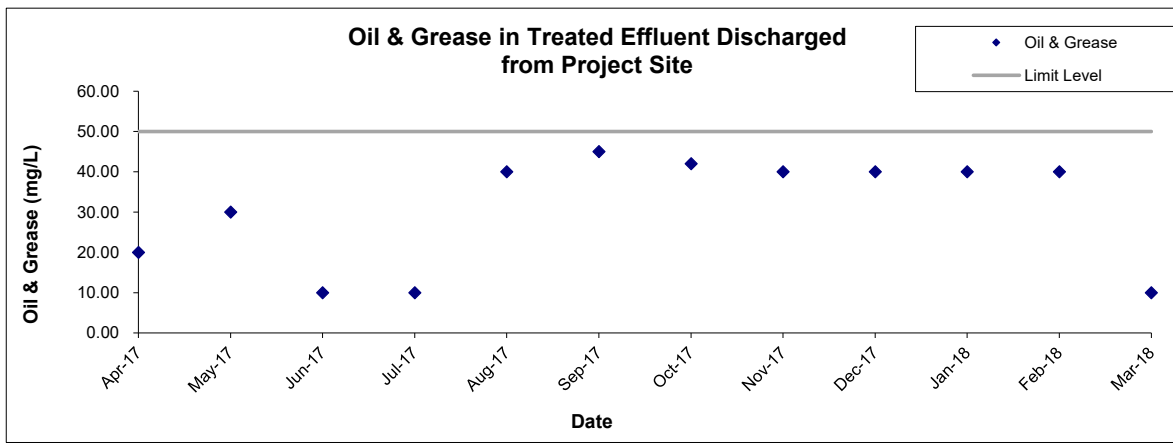


Title Development of a Biodiesel Plant at Tseung Kwan O Industrial Estate Graphical Presentation of Monitoring Results – Air Quality (Odour Intensity Recorded during Odour Patrols)	Scale N.T.S	Project No. MA15052	
	Date Mar 18	Appendix D-7	

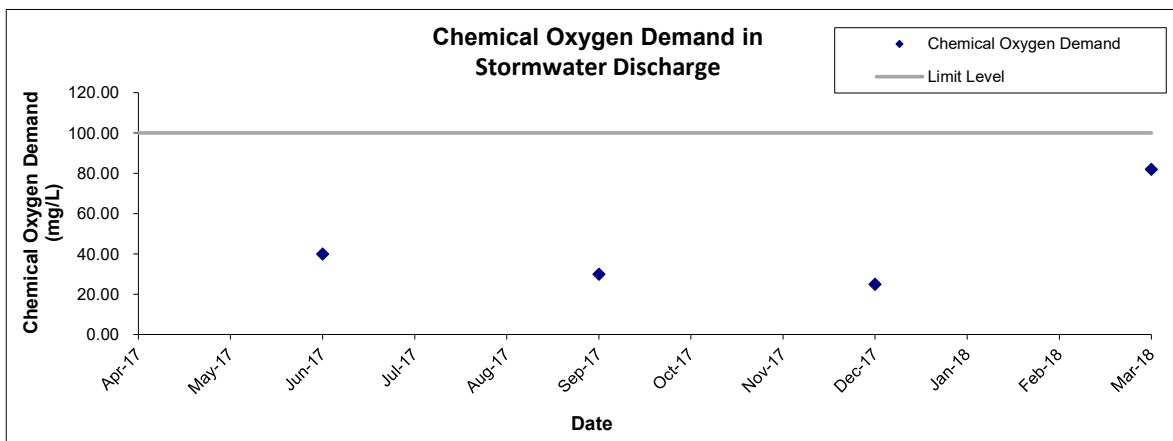
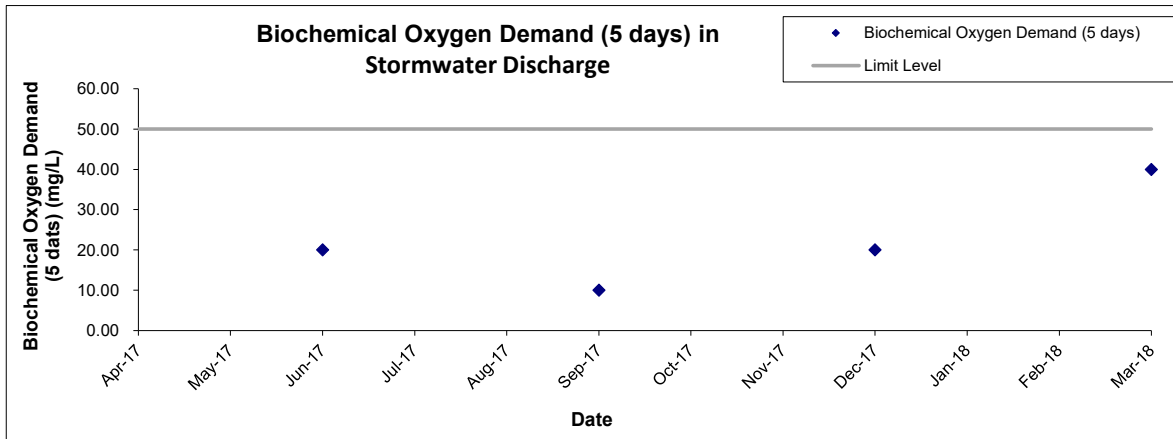
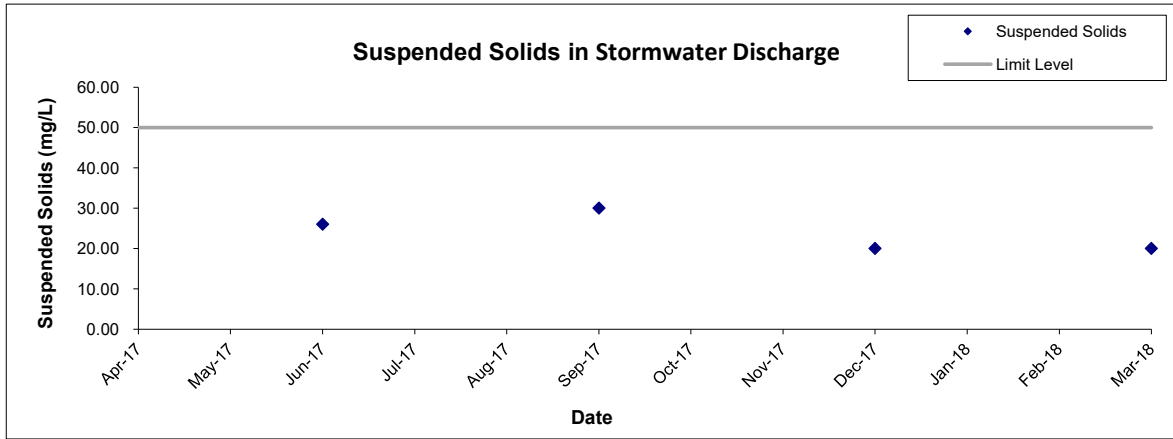
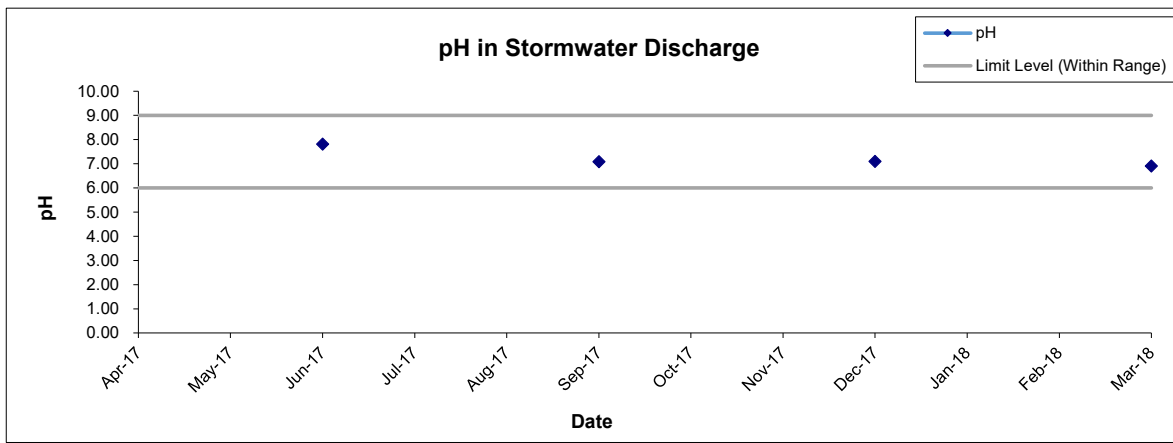
APPENDIX E
Graphical Presentation of Monitoring
Results – Water Quality



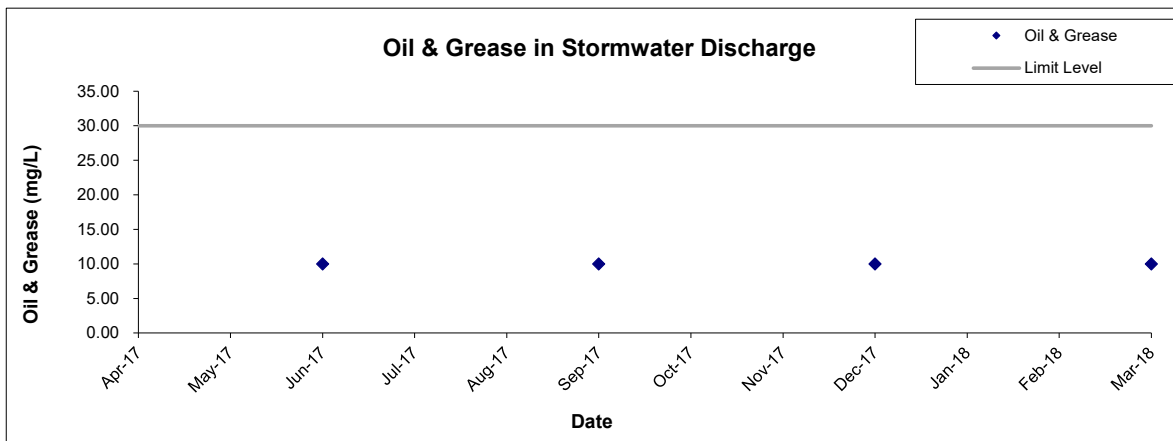
Title Development of a Biodiesel Plant at Tseung Kwan O Industrial Estate Graphical Presentation of Monitoring Results – Water Quality (Treated Effluent Discharged from Project Site)	Scale	N.T.S	Project No.	MA15052	CINOTECH
	Date	Mar 18	Appendix	E-1	



Title Development of a Biodiesel Plant at Tseung Kwan O Industrial Estate Graphical Presentation of Monitoring Results – Water Quality (Treated Effluent Discharged from Project Site)	Scale	N.T.S	Project No.	MA15052	CINOTECH
	Date	Mar 18	Appendix	E-2	

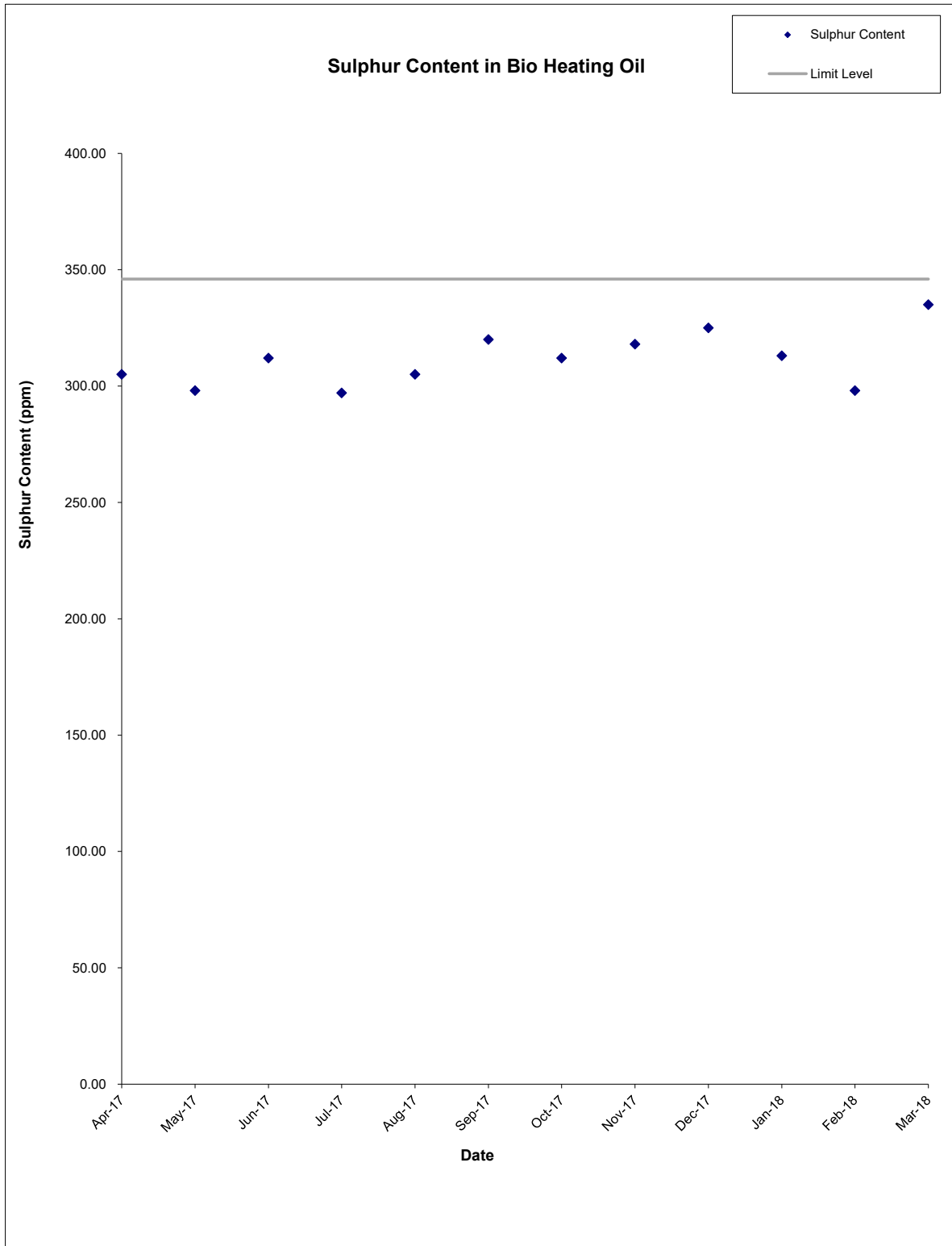


Title Development of a Biodiesel Plant at Tseung Kwan O Industrial Estate Graphical Presentation of Monitoring Results – Water Quality (Stormwater Discharge)	Scale	N.T.S	Project No.	MA15052	CINOTECH
	Date	Mar 18	Appendix	E-3	



Title Development of a Biodiesel Plant at Tseung Kwan O Industrial Estate Graphical Presentation of Monitoring Results – Water Quality (Stormwater Discharge)	Scale N.T.S	Project No. MA15052	CINOTECH
	Date Mar 18	Appendix E-4	

APPENDIX F
Graphical Presentation of Monitoring
Results – Sulphur Content in Bio
Heating Oil



Title Development of a Biodiesel Plant at Tseung Kwan O Industrial Estate Graphical Presentation of Monitoring Results – Sulphur Content in Bio Heating Oil	Scale N.T.S	Project No. MA15052	
	Date Mar 18	Appendix F	

APPENDIX G
Exceedance Report

**Development of a Biodiesel Plant
at Tseung Kwan O Industrial Estate**

Exceedance Report

(A) Exceedance Report for Air Quality

Environmental Monitoring	Sources	Parameter	No. of Exceedance	
			Action Level	Limit Level
Air Quality	Stack of Boiler	Nitrogen oxides (NO _x)	N.A.	2
		Carbon monoxide (CO)	N.A.	0
		Sulphur dioxide (SO ₂)	N.A.	0
		Non-methane Organic Compounds (NMOC)	N.A.	0
		Exhaust gas velocity	N.A.	0
	Stack of Biogas Flare	Nitrogen oxides (NO _x)	N.A.	0
		Carbon monoxide (CO)	N.A.	0
		Sulphur dioxide (SO ₂)	N.A.	0
		Non-methane Organic Compounds (NMOC)	N.A.	1
		Exhaust gas velocity	N.A.	0
	Stack of Process Building	Acetyldehyde	N.A.	0
		Methanol	N.A.	2
		Exhaust gas velocity	N.A.	0
	Odour Concentrations at the Final Air Scrubber	Odour	N.A.	0
		Exhaust gas velocity	N.A.	0
Odour Patrols	Odour	1	0	

**Development of a Biodiesel Plant
at Tseung Kwan O Industrial Estate**

(B) Exceedance Report for Water Quality

Environmental Monitoring	Sources	Parameter	No. of Exceedance	
			Action Level	Limit Level
Water Quality	Treated Effluent Discharged from Project Site	pH	N.A.	0
		Suspended Solids	N.A.	0
		Biochemical Oxygen Demand (BOD) (5 days, 20°C)	N.A.	0
		Chemical Oxygen Demand (COD)	N.A.	0
		Oil & Grease	N.A.	0
		Sulphate	N.A.	0
		Total Nitrogen	N.A.	0
		Total Phosphorus	N.A.	0
	Stormwater Discharge	pH	N.A.	0
		Suspended Solids	N.A.	0
		Biochemical Oxygen Demand (BOD) (5 days, 20°C)	N.A.	0
		Chemical Oxygen Demand (COD)	N.A.	0
		Oil & Grease	N.A.	0

(C) Exceedance Report for Sulphur Content in Bio Heating Oil

Parameter	No. of Exceedance	
	Action Level	Limit Level
Sulphur Content	N.A.	0

APPENDIX H
Complaint Log

APPENDIX H – COMPLAINT LOG**Reporting Quarter:** January – March 2018

Log Ref.	Location	Received Date	Details of Complaint	Investigation/Mitigation Action	Status
COM-2016-09-001	Not Specified	24 th September, 2016	2 Gammon engineers complained about strong odour and oily discharge at 9:15 am	<p>The incident was due to the pump P101A was tripped and led to an overflow of wastewater at Influent Pit T101.</p> <p>According to the project proponent, at 8:45 am, high level alarm at Level Indicator of T101 was triggered and the water level in Influent Pit T101 was over 100%. Investigation found out that wastewater was flooding from Bar Screen Room to road because the pump P101A was not operating in the field (although the pump was indicated operating in Process Control System).</p> <p>Operator then immediately stopped the wastewater feeding to Influent Pit T101, and put sand bags around the stormwater grating outside the pedestrian walkway of Bar Screen Room to block wastewater leaking into storm water drainage. Afterwards, operator cleaned up the area. The problem was resolved at 10:30 am at the same day, and no irritation smell was sensed outside the project site.</p> <p>To prevent recurrence, the following measures are recommended:</p> <ul style="list-style-type: none"> - Cover the storm water grating outside the bar screen room pedestrian walkway by steel plate; - Modify the pump P101A temporary control circuit to feedback overload trip signal back to Process Control System. Maintenance will set up periodic inspection programme to monitor pump performance; and - Review the emergency handling procedures. 	Closed
COM-2016-10-002	Not Specified	5 th October, 2016	EPD referred that a councilor complained about constant smell released from the Project	<p>Investigation found out that housekeeping of the plant was unsatisfactory and improvements are required.</p> <p>Operator has improved housekeeping, including:</p> <ul style="list-style-type: none"> - Always keep the gate of the grease trap waste screening room closed; - Always keep sludge containers closed; - Frequent cleaning of drainage system; and - Always keep the work site clean and tidy 	Closed

Log Ref.	Location	Received Date	Details of Complaint	Investigation/Mitigation Action	Status
COM-2016-10-003	Not Specified	18 th October, 2016	EPD referred that a complaint on malodour from the Project was received on 11 th October 2016	Investigation found no process upset during that week. Operator has put the best effort housekeeping (e.g. keeping sludge containers and rooms closed and frequent cleaning of drainage system), and staff have been trained on housekeeping.	Closed
COM-2017-02-004	Not Specified	6 th February, 2017	EPD referred complaints from Drainage Service Department (DSD) and neighboring sites regarding the blockage of public sewerage system along Chun Wang Street. DSD reported to EPD that some oily substances and debris had blocked the sewerage system.	Investigation found similar substances (i.e. oily substances and debris) at the foul manhole within the Plant. Investigation also found that untreated effluent was discharged to a foul manhole within the Plant. Follow-up action (i.e. cleaning of internal sewerage system, from FMH01 to TFMH01) was carried out in early February. In addition, operator has put the best effort (e.g. carry out staff training) to ensure that all effluent are treated properly by wastewater treatment facilities before discharge.	Closed
COM-2017-07-005	Not Specified	4 th July, 2017	EPD referred that resident of LOHAS Park complained operation of ASB plant caused noise nuisance (low frequency machinery noise continuously round the clock) and emitted unpleasant malodour on 19 June, 2017.	<u>Noise Nuisance</u> Since there are other noise sources which operate continuously round the clock (e.g. cooling tower from other buildings) between the Project Site and LOHAS Park, the noise nuisance could be due to other noise sources. In addition, investigation found no process upset on that day. Considering the long distance (at least 900m) between the Project Site and LOHAS Park, the noise nuisance may not be caused by the operator. <u>Unpleasant Malodour</u> Investigation found no process upset during the week. Since the regular odour monitoring (i.e. odour measurement at the Final Air Scrubber and odour patrol along Site boundary) did not report any exceedance event (except this complaint) in June and July 2017, the unpleasant malodour may not be caused by the Project considering the long distance (at least 900m) between the Project Site and LOHAS Park. Operator has, and will, put the best effort housekeeping (e.g. keeping sludge containers and rooms closed and frequent cleaning of drainage system) to minimize odour nuisance.	Closed

Log Ref.	Location	Received Date	Details of Complaint	Investigation/Mitigation Action	Status
COM-2017-07-006	Stack of Boiler	4 th July, 2017	EPD referred that a complaint on continuous dark smoke emission from Stack of Boiler on 30 June, 2017 at about 6 pm.	Investigation found that a Pressure Control Valve had malfunctioned, causing unsteady oil flow into burner. This led to a low air to fuel ratio which ultimately led to dark smoke emission. The Valve was repaired on 1 st July 2017 morning, and no dark smoke was emitted.	Closed
COM-2017-10-007	Not Specified	6 th October 2017	EPD referred that employee of nearby plant (Chun Wang Street, Tseung Kwan O Industrial Estate) complained ASB biodiesel plant emitting malodour continuously.	Investigation found no process upset during the week. Regular odour monitoring (i.e. odour measurement at the Final Air Scrubber and odour patrol along Site boundary) did not report any exceedance event (except complaint) in this reporting month. Nevertheless, as joint site visit on 1 st November 2017 carried out by ET & IEC identified several environmental deficiencies. Necessary actions were proposed to the operator, and the operator has been rectifying the deficiencies.	Ongoing
COM-2017-10-008	Not Specified	17 th October 2017	EPD referred that employee of nearby plant (Chun Wang Street, Tseung Kwan O Industrial Estate) complained ASB biodiesel plant emitting malodour from 7:15am to afternoon on 12 Oct 2017 and from 7:50am to afternoon on 13 Oct 2017.	Investigation found no process upset during the week. Regular odour monitoring (i.e. odour measurement at the Final Air Scrubber and odour patrol along Site boundary) did not report any exceedance event (except complaint) in this reporting month. Nevertheless, as joint site visit on 1 st November 2017 carried out by ET & IEC identified several environmental deficiencies. Necessary actions were proposed to the operator, and the operator has been rectifying the deficiencies.	Ongoing
COM-2017-11-009	Stack of Boiler	17 th November 2017	EPD referred that a complaint was received regarding continuous dark smoke emission from Stack of Boiler on 14 Nov 2017 at 12:50pm.	Investigation found that the steam boiler was tripped, which might cause dark smoke emission. The operator had stopped the production immediately, and carried out maintenance work to rectify the problem.	Ongoing

Log Ref.	Location	Received Date	Details of Complaint	Investigation/Mitigation Action	Status
COM-2017-11-010	Stack of Boiler	20 th November 2017	EPD referred that a complaint was received regarding continuous dark smoke emission from Stack of Boiler on 18 Nov 2017 from 11:00am to noon (12:00).	Investigation found that the steam boiler was tripped, which might cause dark smoke emission. The operator had stopped the production immediately, and carried out maintenance work to rectify the problem.	Ongoing
COM-2017-11-011	Not Specified	21 st November 2017	EPD referred that employee of nearby plant complained ASB biodiesel plant emitting malodour continuously.	Although investigation found no process upset during the week, the roller door of the sludge container room was impaired, which would emit malodour. The operator will fix the roller door. Nevertheless, regular odour monitoring (i.e. odour measurement at the Final Air Scrubber and odour patrol along Site boundary) did not report any exceedance event (except complaint) in this reporting month. Besides, joint site visit on 11 th December 2017 carried out by ET & IEC identified several environmental deficiencies. Necessary actions were proposed to the operator, and the operator has been rectifying the deficiencies.	Ongoing
COM-2017-11-012	Not Specified	23 th November 2017	EPD referred that a complainant complained ASB biodiesel plant emitting malodour across Chun Wang Street.	Investigation found no process upset during the week. The impaired roller door of the sludge container room (COM-2017-11-011) hadn't been fixed. The operator will fix the roller door. Nevertheless, regular odour monitoring (i.e. odour measurement at the Final Air Scrubber and odour patrol along Site boundary) did not report any exceedance event (except complaint) in this reporting month. Besides, joint site visit on 11 th December 2017 carried out by ET & IEC identified several environmental deficiencies. Necessary actions were proposed to the operator, and the operator has been rectifying the deficiencies.	Ongoing
COM-2017-11-013	Not Specified	29 th November 2017	EPD referred that a complainant at Tseung Kwan O Industrial Estate complained ASB biodiesel plant emitting malodour continuously, from Monday to Saturday, from 8:00am to 7:00pm. The complainant	Regular odour monitoring (i.e. odour measurement at the Final Air Scrubber and odour patrol along Site boundary) did not report any exceedance event (except complaint) since the commencement of the Project's operational phase. Nevertheless, during the year, site visits carried out by EPD and site audits carried out jointly by the operator, ET and IEC identified environmental deficiencies which would pose malodour problem. The recent joint site audit carried out by the operator, ET and IEC on 11 th Decmber 2017 identified several environmental deficiencies.	Ongoing

Log Ref.	Location	Received Date	Details of Complaint	Investigation/Mitigation Action	Status
			suspected that the odourous gas is toxic and causes air pollution. The complainant also pointed out that complaint on malodour was raised one year ago. Although the malodour was mitigated after EPD's follow-up action, the problem resumed after 2 weeks.	Necessary actions were proposed to the operator, and the operator has been rectifying the deficiencies. Regarding the complainant suspected that the odourous gas is toxic, the investigation is still in progress.	
COM-2017-11-014	Not Specified	29 th November 2017	EPD referred that a complaint complained oily substances being discharged from an outfall near the roundabout at the western end of Chun Wang Street. The oily substances was suspected to be discharged from the ASB biodiesel plant.	Investigation work has been carried out. A joint site visit on 11 th December 2017 carried out by ET & IEC found oily substance being left near drainage channel, the operator is advised to 1.) clean up the oily substance; 2.) check and clean the oil interceptor; and 3.) clean the drainage system.	Ongoing
COM-2018-01-015	Not Specified	29 th January 2018	EPD referred that a complainant complained ASB biodiesel plant emitting malodour across Chun Wang Street.	Investigation found that the tricanter in the wastewater treatment plant was blocked on 29 th January 2018. During maintenance on the same day, some odourous material (e.g. sludge) spilled out. The operator has cleaned up the spilled material. Joint site visit on 5 th February 2018 carried out by ET & IEC identified several environmental deficiencies. Necessary actions were proposed to the operator, and the operator has been rectifying the deficiencies.	Ongoing