MONTHLY EM&A REPORT

OSCAR Bioenergy Joint Venture

Contract No. EP/SP/61/10 Organic Resources Recovery Centre (Phase 1): *Forty-sixth Monthly EM&A Report*

1 March 2019 – 31 March 2019

Environmental Resources Management
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Meinhardt Infrastructure and Environment Limited

Organic Resources Recovery Centre, Phase I

Monthly EM&A Report

(1 March 2019 – 31 March 2019)

(April 2019)

Verified by: Helen Cochrane

Position: Independent Environmental Checker

Date: 12 Apr 2019

MONTHLY EM&A REPORT

OSCAR Bioenergy Joint Venture

Contract No. EP/SP/61/10 Organic Resources Recovery Centre (Phase 1): *Forty-sixth Monthly EM&A Report*

1 March 2019 – 31 March 2019

Reference 0279222

For and on behalf of ERM-Hong Kong, Limited

Approved by: Frank Wan

Signed:

Position: Partner

Certified by:
(Environmental Team Leader – Mandy To)

Certified by:
(Registered Landscape Architect No. R-150 - Albert Chung)

Date: 11 April 2019

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EXECUTIVE SUMMARY

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EXECUTIVE SUMMARY

The construction works of ***No. EP/SP/61/10 Organic Resources Recovery Centre Phase 1 (the Project)*** commenced on 21 May 2015. This is the 46th monthly Environmental Monitoring and Audit (EM&A) report presenting the EM&A works carried out during the period from 1 to 31 March 2019 in accordance with the EM&A Manual. Substantial completion of the construction works was confirmed on 3 December 2018. In the meantime, the operation phase EM&A programme had commenced in March 2019.

Summary of Works undertaken during the Reporting Month

Works undertaken in the reporting month included:

- Systems being operated – waste reception, pre-treatment, CAPCS extraction, the digesters, the centrifuge, the desulphurisation, the emergency flare, the CHPs, the ASP and the biological wastewater treatment plant; and

- Process commissioning in progress, operations included waste reception, pre-treatment, CAPCS extraction, the digesters, the centrifuge, the composting tunnels, the desulphurisation, the emergency flare, the CHPs, the ASP and the biological waste water treatment plant (about 110-130t/d SSOW input).

Environmental Monitoring and Audit Progress

A summary of the monitoring activities undertaken in this reporting period is listed below:

- Joint Environmental Site Inspections 4 times
- Landscape & Visual Inspections 2 times

Odour

Odour patrol were conducted by representatives of the Contractor, the ER and Employer (EPD Project Team) on 1, 4, 8, 11, 13, 15, 18, 20, 22, 25, 27 and 29 March 2019. The Independent Odour Patrol Team, ALS Technichem (HK) Pty Ltd (ALS), has also joined the odour patrol on 1 March 2019. No Level 2 Odour Intensity was recorded during odour patrols.

Air samples were also collected at the CAPC unit for olfactometry analysis at the laboratory on 10, 11, 19 and 27 December 2018 and 16 and 29 January 2019. The odour level of the samples collected on 10, 11, 19 and 27 December 2018 and 16 January 2019 have exceeded the odour limit. An investigation of the cause of the exceedance has been carried out. The investigation report is shown in *Annex I*.

Waste Management

Waste generated from this Project includes inert construction and demolition (C&D) materials (public fill) and non-inert C&D materials (construction wastes).

Inert C&D materials (public fill) include bricks, concrete, building debris, rubble and excavated spoil. In total, 190.40 tonnes of inert C&D material were generated from the Project.

Non-inert C&D materials (construction wastes) include metals, paper / cardboard packaging waste, plastics and other wastes such as general refuse. 0.00 kg of metals, 0.00 kg of papers/ cardboard packing and 0.00 kg of plastics were sent to recyclers for recycling during the reporting period. 16.45 tonnes of general refuse was disposed of at the landfill.

0.00 L of chemical waste was collected by licenced waste collector.

Environmental Site Inspection

Four weekly joint environmental site inspections were carried out by the representatives of the Contractor and the ET. The IEC was also present at the joint inspection on 22 March 2019. Details of the audit findings and implementation status of the mitigation measures are presented in *Section 6.1*.

Landscape & Visual

On-site inspections on landscape and visual mitigation measures were performed on 8 and 22 March 2019. Details of the audit findings and implementation status of the mitigation measures are presented in *Sections 6.2*.

Environmental Exceedance/Non-conformance/Compliant/Summons and Prosecution

No exceedance was recorded during the reporting period.

No incident occurred during the reporting period.

No complaint/ summon/prosecution was received in this reporting period.

Future Key Issues

A letter proposing the termination of the construction phase EM&A programme will be provided to attain EPD's approval. Monitoring results of stack emissions will be provided once available to show compliance with the monitoring requirements stated in the EM&A Manual (Rev. E) to support the termination of the construction phase EM&A programme.

The ET will prepare a Final EM&A report to summarise the findings of the construction EM&A programme for EPD's approval.

1 INTRODUCTION

ERM-Hong Kong, Limited (ERM) was appointed by OSCAR Bioenergy Joint Venture (the Contractor) as the Environmental Team (ET) to undertake the Environmental Monitoring and Audit (EM&A) programme for the ***Contract No. EP/SP/61/10 of Organic Waste Treatment Facilities Phase I,*** which the project name has been updated to ***Organic Resources Recovery Centre (Phase I) (the Project)*** since November 2017.

1.1 PURPOSE OF THE REPORT

This is the 46th EM&A report which summarises the monitoring results and audit findings for the EM&A programme during the reporting period from **1** to **31 March 2019**.

1.2 STRUCTURE OF THE REPORT

The structure of the report is as follows:

Section 1: **Introduction**
It details the scope and structure of the report.

Section 2: **Project Information**
It summarises the background and scope of the Project, site description, project organization, construction programme, activities undertaken and status of the Environmental Permits (EP)/licences.

Section 3: **Environmental Monitoring Requirements**
It summarises the environmental monitoring requirements including monitoring parameters, programmes, methodologies, frequency, locations, Action and Limit Levels, Event/Action Plans, environmental mitigation measures as recommended in the EM&A Manual and approved EIA report.

Section 4: **Implementation Status on Environmental Mitigation Measures**
It summarises the implementation of environmental protection measures during the reporting period.

Section 5: **Waste Management**
It summarises the quantity of public fill and construction waste generated in the reporting period

Section 6: **Environmental Site Inspection**
It summarises the audit findings of the weekly site inspections undertaken within the reporting period.

Section 7: **Environmental Non-conformance**

It summarises any exceedance of environmental performance standard, environmental complaints and summons received within the reporting period.

Section 8: **Further Key Issues**
It summarises the impact forecast for the next reporting month.

Section 9: **Conclusions**

2 PROJECT INFORMATION

2.1 BACKGROUND

The Organic Resources Recovery Centre (ORRC) Phase I development (hereinafter referred to as "the Project") is to design, construct and operate a biological treatment facility with a capacity of about 200 tonnes per day and convert source-separated organic waste from commercial and industrial sectors (mostly food waste) into compost and biogas through proven biological treatment technologies.

The environmental acceptability of the construction and operation of the Project had been confirmed by findings of the associated Environmental Impact Assessment (EIA) Study completed in 2009. The Director of Environmental Protection approved this EIA Report under the Environmental Impact Assessment Ordinance (EIAO) (Cap. 499) in February 2010 (Register No.: AEIAR-149/2010) (hereafter referred to as the approved EIA Report). Subsequent Report on Re-assessment on Environmental Implications and Report on Re-assessment on Hazard to Life Implications were completed in 2013, respectively.

An Environmental Permit (EP) (No. EP-395/2010) was issued by the Environmental Protection Department (EPD) to the EPD, the Permit Holder, on 21 June 2010 and varied on 18 March 2013 (No. EP-395/2010/A) and 21 May 2013 (No. EP-395/2010/B), respectively. The Design Build and Operate Contract for the ORRC Phase 1 (Contract No. EP/SP/61/10 Organic Resources Recovery Centre (Phase 1) (the Contract)) was awarded to SITA Waste Services Limited, ATAL Engineering Limited and Ros-Roca, Sociedad Anonima jointly trading as the OSCAR Bioenergy Joint Venture (OSCAR or the Contractor). A Further EP (No. FEP-01/395/2010/B) was issued by the EPD to the OSCAR on 16 February 2015. Variation to both EPs No. EP-395/2010/B and No. FEP-01/395/2010/B were made in December 2015. The latest EPs, No. EP-395/2010/C and No. FEP-01/395/2010/C, were issued by the EPD on 21 December 2015.

Under the requirements of Condition 5 of the EP (No. FEP-01/395/2010/C), an Environmental Monitoring and Audit (EM&A) programme as set out in the Agreement No. CE7/2008 (EP) EM&A Manual (hereinafter referred to as EM&A Manual) is required to be implemented. ERM-Hong Kong, Ltd (ERM) has been appointed by OSCAR as the Environmental Team (ET) to undertake the EM&A programme for the Contract.

The construction works commenced on 21 May 2015. Substantial completion of the construction works was confirmed on 3 December 2018. The operation phase EM&A programme has commenced in March 2019.

2.2 GENERAL SITE DESCRIPTION

The Project Site is located at Siu Ho Wan in North Lantau with an area of about 2 hectares. The layout of the Project Site is illustrated in *Annex A*.

2.3 CONSTRUCTION ACTIVITIES

A summary of the major activities undertaken in the reporting period is shown in *Table 2.1*. The site layout plan is shown in *Annex B*. The construction programme of the Project is presented in *Annex C*.

Table 2.1 Summary of Activities Undertaken in the Reporting Period

Activities Undertaken in the Reporting Period
• Systems being operated – waste reception, pre-treatment, CAPCS extraction, the digesters, the centrifuge, the desulphurization, the emergency flare, the CHPs, the ASP and the biological waste water treatment plant; • Process commissioning in progress - waste reception, pre-treatment, CAPCS extraction, the digesters, the centrifuge, the composting tunnels, the desulphurisation, the emergency flare, the CHPs, the ASP and the biological waste water treatment plant (about 110-130 t/d SSOW input).

2.4 PROJECT ORGANISATION AND MANAGEMENT STRUCTURE

The project organisation chart and contact details are shown in *Annex D*.

2.5 STATUS OF ENVIRONMENTAL APPROVAL DOCUMENTS

A summary of the valid permits, licences, and/or notifications on environmental protection for this Project is presented in *Table 2.2*.

Table 2.2 Summary of Environmental Licensing, Notification and Permit Status

Permit/ Licences/ Notification	Reference	Validity Period	Remarks
Environmental Permit	FEP-01/395/2010/C	Throughout the Contract	Permit granted on 21 December 2015
Notification of Construction Works under the Air Pollution Control (Construction Dust) Regulation	Ref No. 386715	Throughout the Contract	-
Effluent Discharge License	WT00024352-2016	3 June 2016 – 30 June 2021	Approved on 3 June 2016
Construction Noise Permit – P1&P2	GW-RW0538-18 (Superseded CNP GW-RW0229-18)	21 January 2019-20 July 2019	Approved on 31 December 2018
Construction Noise Permit – P5 (slope)	GW-RW0347-18 (superseded the GW-RW0107-18)	30 September 2018 – 29 March 2019	Approved on 15 August 2018

Permit/ Licences/ Notification	Reference	Validity Period	Remarks
Chemical Waste Producer Registration	WPN 5213-961-O2231-01	Throughout the Contract	Approved on 29 April 2015
Waste Disposal Billing Account	Account number: 702310	Throughout the Contract	-

3 *ENVIRONMENTAL MONITORING REQUIREMENTS, ENVIRONMENTAL MITIGATION MEASURES*

All the relevant environmental mitigation measures listed in the approved EIA Report and EM&A Manual are summarised in *Annex E*.

According to the EM&A Manual and EP requirements, no air quality, noise and water quality monitoring is required during the construction phase.

According to the EM&A Manual and EP requirements, odour monitoring is required during the commissioning phase.

The odour patrols shall be conducted by an odour patrol team. The odour patrol team will patrol and sniff along an odour patrol route at the site boundary. The implementation of the odour patrol shall be subject to the prevailing weather forecast condition and no odour patrol should be carried out during rainy day. The odour patrol team should be comprised of at least two independent trained personnel / competent persons, who should pass a set of screening tests.

Odour patrols were conducted by representatives of the Contractor, the ER and Employer (EPD Project Team) on 1, 4, 8, 11, 13, 15, 18, 20, 22, 25, 27 and 29 March 2019. The Independent Odour Patrol Team, ALS Technichem (HK) Pty Ltd (ALS), has also joined the odour patrol on 1 March 2019. According to the EM&A Manual and EP requirements, it is considered an exceedance if the odour intensity recorded by the panellists is Level 2 or above. During this reporting period, no Level 2 Odour Intensity was recorded. The odour patrol results are shown in *Annex H*.

On 10, 11, 19 and 27 December 2018 and 16 and 29 January 2019, air samples were also collected from the outlet of the Centralised Air Pollution Control (CAPC) unit by ALS for measurement of the Odour Intensity by olfactometry analysis at the laboratory. According to the EM&A Manual and EP requirements, it is considered an exceedance if the odour level is more than 220 OU/Nm^3. On 10, 11, 19 and 27 December 2018 and 16 January 2019, the odour level of the odour samples collected from the CAPC unit have exceeded the odour limits stated in *Table 2.2* of the EM&A Manual. No exceedance was found for the samples collected on 29 January 2019. The laboratory results are shown in *Annex H*.

Investigation of the exceedances has been conducted. The investigation report is shown in *Annex I*.

Monitoring results of air quality parameters from stack emissions of the centralised air pollution control system, the ammonia stripping plant and the cogeneration units will be provided once available to show compliance with the monitoring requirements stated in the EM&A Manual (Rev. E) to support the termination of the construction phase EM&A programme.

Bi-weekly landscape and visual audit is required to ensure that the design, implementation and maintenance of landscape and visual mitigation measures recommended in the approved EIA Report are fully achieved.

4 IMPLEMENTATION STATUS ON ENVIRONMENTAL PROTECTION REQUIREMENTS

The Contractor has implemented environmental mitigation measures and requirements as stated in the approved EIA Report and EM&A Manual. The implementation status of the measures during the reporting period is summarised in *Annex E*.

Wastes generated from this Project include inert construction and demolition (C&D) materials (public fill) and non-inert C&D materials (construction waste). Construction waste comprises general refuse, metals and paper/cardboard packaging materials. Metals generated from the Project are also grouped into construction waste as the materials were not disposed of with others at public fill. Reference has been made to the Monthly Summary Waste Flow Table prepared by the Contractor (see *Annex F*). With reference to the relevant handling records and trip tickets of this Project, the quantities of different types of waste generated in the reporting month are summarised in *Table 5.1*.

Table 5.1 Quantities of Waste Generated from the Project

Month / Year	Quantity			
	Total Inert C&D Materials Generated [a]	Non-inert C&D Materials [b]		
		C&D Materials Recycled [c]	C&D Waste Disposed of at Landfill [d]	Chemical Waste
March 2019	190.40 tonnes	0.00 kg	16.45 tonnes	0.00 L

Notes:

(a) Inert C&D materials (public fill) include bricks, concrete, building debris, rubble and excavated spoil. In total, 190.40 tonnes of inert C&D material were generated from the Project. The detailed waste flow is presented in *Annex F*.

(b) Non-inert C&D materials (construction wastes) include metals, paper / cardboard packaging waste, plastics and other wastes such as general refuse. Metals generated from the Project were grouped into construction wastes as the materials were not disposed of with others at the public fill.

(c) 0.00 kg of metals, 0.00 kg of papers/ cardboard packing and 0.00 kg of plastics were sent to recyclers for recycling during the reporting period.

(d) Construction wastes other than metals, paper/cardboard packaging, plastics and chemicals were disposed of at NENT Landfill by subcontractors.

6 ENVIRONMENTAL INSPECTIONS

6.1 WEEKLY SITE AUDITS

Joint site inspections were conducted by representatives of the Contractor, the ER, IC and the ET on 8, 15, 22 and 28 March 2019. The IEC was also present at the joint inspection on 22 March 2019. Follow-up actions resulting from the last site inspections were generally taken as reported by the Contractor.

Key observations during the reporting period are summarised as follows:

8 March 2019

- Chemical drums were observed near Building 2 and the contractor was advised to provide drip trays to the chemical drums or replace the drums to designed storage area according to the Code of Practice.

15 March 2019

- Chemical drums were observed near Building 2 and the contractor was advised to provide drip trays to the chemical drums or replace the drums to designed storage area according to the Code of Practice.

22 March 2019

- Chemical drums of less quantity were observed near Building 2 and the contractor was advised to provide drip trays to the remaining chemical drums or replace the remaining drums to designed storage area according to the Code of Practice.

28 March 2019

- Remaining chemical drums were observed near Building 2 and the contractor was advised to provide drip trays to the remaining chemical drums or replace the remaining drums to designed storage area according to the Code of Practice.

6.2 LANDSCAPE AND VISUAL AUDIT

In accordance with the EM&A Manual, bi-weekly landscape and visual inspection is required to ensure that the design, implementation and maintenance of landscape and visual mitigation measures recommended in the EIA Report are fully achieved. On-site inspections of the landscape and visual mitigation measures were performed on 8 and 22 March 2019.

It was confirmed that the necessary landscape and visual mitigation measures as summarised in *Annex E* were generally implemented by the Contractor. No specific observation was found during site inspections on 8 and 22 March 2019.

7 ENVIRONMENTAL NON-CONFORMANCE

7.1 SUMMARY OF ENVIRONMENTAL NON-COMPLIANCE

No non-compliance event was received during the reporting period.

7.2 SUMMARY OF ENVIRONMENTAL COMPLAINT

No complaint was received during the reporting period.

7.3 SUMMARY OF ENVIRONMENTAL SUMMON AND SUCCESSFUL PROSECUTION

No summon/prosecution was received during the reporting period. The cumulative summons/prosecution log is shown in *Annex G*.

8 FUTURE KEY ISSUES

8.1 KEY ISSUES FOR THE COMING MONTH

A letter proposing the termination of the construction phase EM&A programme will be provided to attain EPD's approval. Monitoring results of stack emissions will be provided once available to show compliance with the monitoring requirements stated in the EM&A Manual (Rev. E) to support the termination of the construction phase EM&A programme.

The ET will prepare a Final EM&A report to summarise the findings of the construction EM&A programme for EPD's approval.

8.2 CONSTRUCTION PROGRAMME

The most up-to-date construction programme for the Project is presented in *Annex C*.

9 CONCLUSIONS

This EM&A Report presents the EM&A programme undertaken during the reporting period from 1 to 31 March 2019 in accordance with EM&A Manual and requirements of EP (FEP-01/395/2010/C).

No air quality, noise and water quality monitoring is required during the construction phase.

Odour patrols and monitoring are required during the commissioning phase. No exceedance of odour intensity limit for all odour patrol events. Air samples were collected at the CAPC unit for olfactometry analysis at the laboratory on 10, 11, 19 and 27 December 2018 and 16 and 29 January 2019. The odour level of the samples collected on 10, 11, 19 and 27 December 2018 and 16 January 2019 have exceeded the odour limit. An investigation of the cause of the exceedance has been carried out. The investigation report is shown in *Annex I*.

Bi-weekly landscape and visual monitoring was conducted in the reporting period. The necessary landscape and visual mitigation measures recommended in the approved EIA Report were generally implemented by the Contractor.

No incident occurred during reporting period.

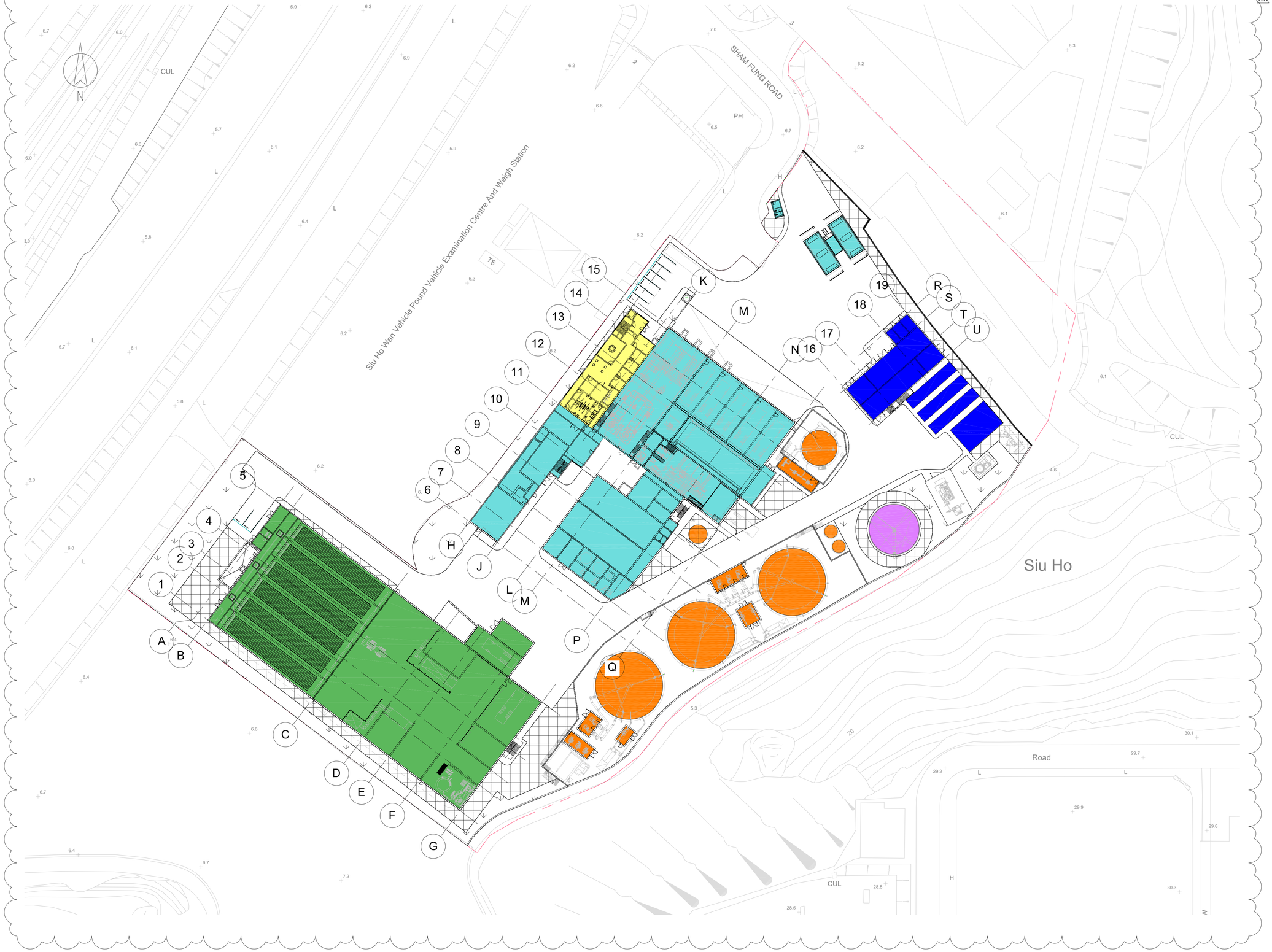
No complaint/summon/prosecution was received.

A letter proposing the termination of the construction phase EM&A programme will be provided to attain EPD's approval. Monitoring results of stack emissions will be provided once available to show compliance with the monitoring requirements stated in the EM&A Manual (Rev. E) to support the termination of the construction phase EM&A programme.

The ET will prepare a Final EM&A report to summarise the findings of the construction EM&A programme for EPD's approval.

Annex A

Project Layout



REV	DATE	BY	APP	DESCRIPTION
A01	05/03/15	CW	MB	IMTECH BACKGROUNDS UPDATED
A00	18/02/15	CW	MB	DRAFT ISSUE

CLIENT

ENVIRONMENTAL PROTECTION DEPARTMENT
GOVERNMENT OF THE HKSAR

CLIENT'S CONSULTANT

AECOM ASIA CO. LTD.

CONTRACTOR

OSCAR BIOENERGY JV

LEAD DESIGNER

ARUP
Ove Arup & Partners Hong Kong Limited

ENVIRONMENTAL TEAM

ERM HONG KONG LIMITED

INDEPENDENT CONSULTANTS

Meinhardt Infrastructure and Environment Limited
邁進基建環保工程顧問有限公司

PROJECT

ORGANIC WASTE TREATMENT FACILITIES
PHASE 1
EP/SP/61/10

STATUS

DRAFT ISSUE

DRAWING TITLE

SITE LAYOUT

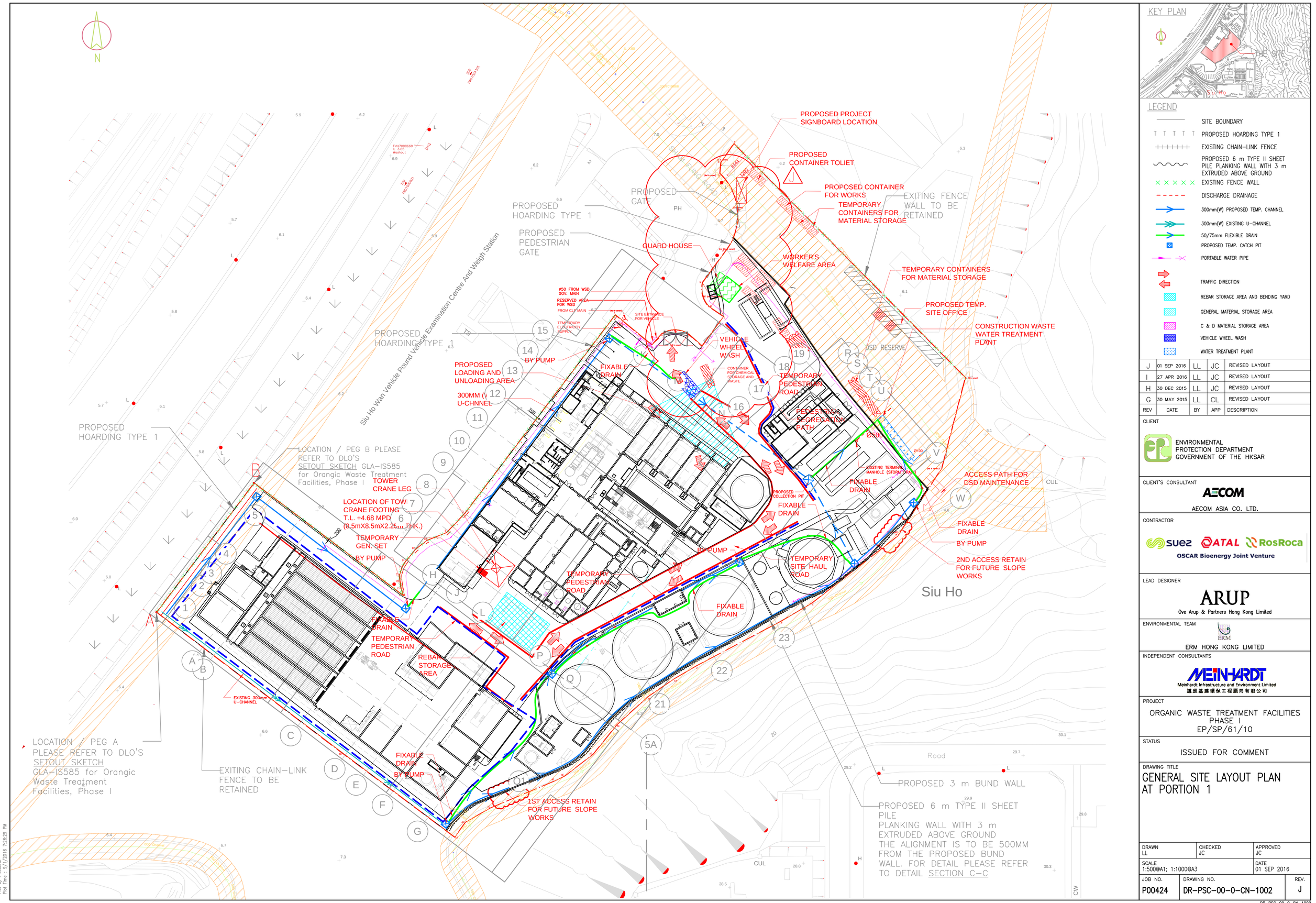
DRAWN	CHECKED	APPROVED
CW	RS	DP

SCALE	DATE
1:500@A1 / 1:1000@A3	12/02/15

JOB NO.	DRAWING NO.	REV.
239956	DR-OAP-20-0-CA-1001	A01

Annex B

Works Location



KEY PLAN

LEGEND

- SITE BOUNDARY
- PROPOSED HOARDING TYPE 1
- EXISTING CHAIN-LINK FENCE
- PROPOSED 6 m TYPE II SHEET PILE PLANKING WALL WITH 3 m EXTRUDED ABOVE GROUND
- EXISTING FENCE WALL
- DISCHARGE DRAINAGE
- 300mm(W) PROPOSED TEMP. CHANNEL
- 300mm(W) EXISTING U-CHANNEL
- 50/75mm FLEXIBLE DRAIN
- PROPOSED TEMP. CATCH PIT
- PORTABLE WATER PIPE
- TRAFFIC DIRECTION
- REBAR STORAGE AREA AND BENDING YARD
- GENERAL MATERIAL STORAGE AREA
- C & D MATERIAL STORAGE AREA
- VEHICLE WHEEL WASH
- WATER TREATMENT PLANT

REV	DATE	BY	APP	DESCRIPTION
J	01 SEP 2016	LL	JC	REVISED LAYOUT
I	27 APR 2016	LL	JC	REVISED LAYOUT
H	30 DEC 2015	LL	JC	REVISED LAYOUT
G	30 MAY 2015	LL	CL	REVISED LAYOUT

CLIENT

ENVIRONMENTAL PROTECTION DEPARTMENT
GOVERNMENT OF THE HKSAR

CLIENT'S CONSULTANT

AECOM
AECOM ASIA CO. LTD.

CONTRACTOR

SUEZ ATAL RosRoca
OSCAR Bioenergy Joint Venture

LEAD DESIGNER

ARUP
Ove Arup & Partners Hong Kong Limited

ENVIRONMENTAL TEAM

ERM
ERM HONG KONG LIMITED

INDEPENDENT CONSULTANTS

MEINHARDT
Meinhardt Infrastructure and Environment Limited
邁進基建環保工程顧問有限公司

PROJECT

ORGANIC WASTE TREATMENT FACILITIES
PHASE I
EP/SP/61/10

STATUS

ISSUED FOR COMMENT

DRAWING TITLE

GENERAL SITE LAYOUT PLAN AT PORTION 1

DRAWN	CHECKED	APPROVED
LL	JC	JC

SCALE	DATE
1:500@A1; 1:1000@A3	01 SEP 2016

JOB NO.	DRAWING NO.	REV.
P00424	DR-PSC-00-0-CN-1002	J

Plot by : LeoLAM
Plot Time : 9/1/2016 7:26:29 PM

DR-PSC-00-0-CN-1002

Annex C

Construction Programme of the Project

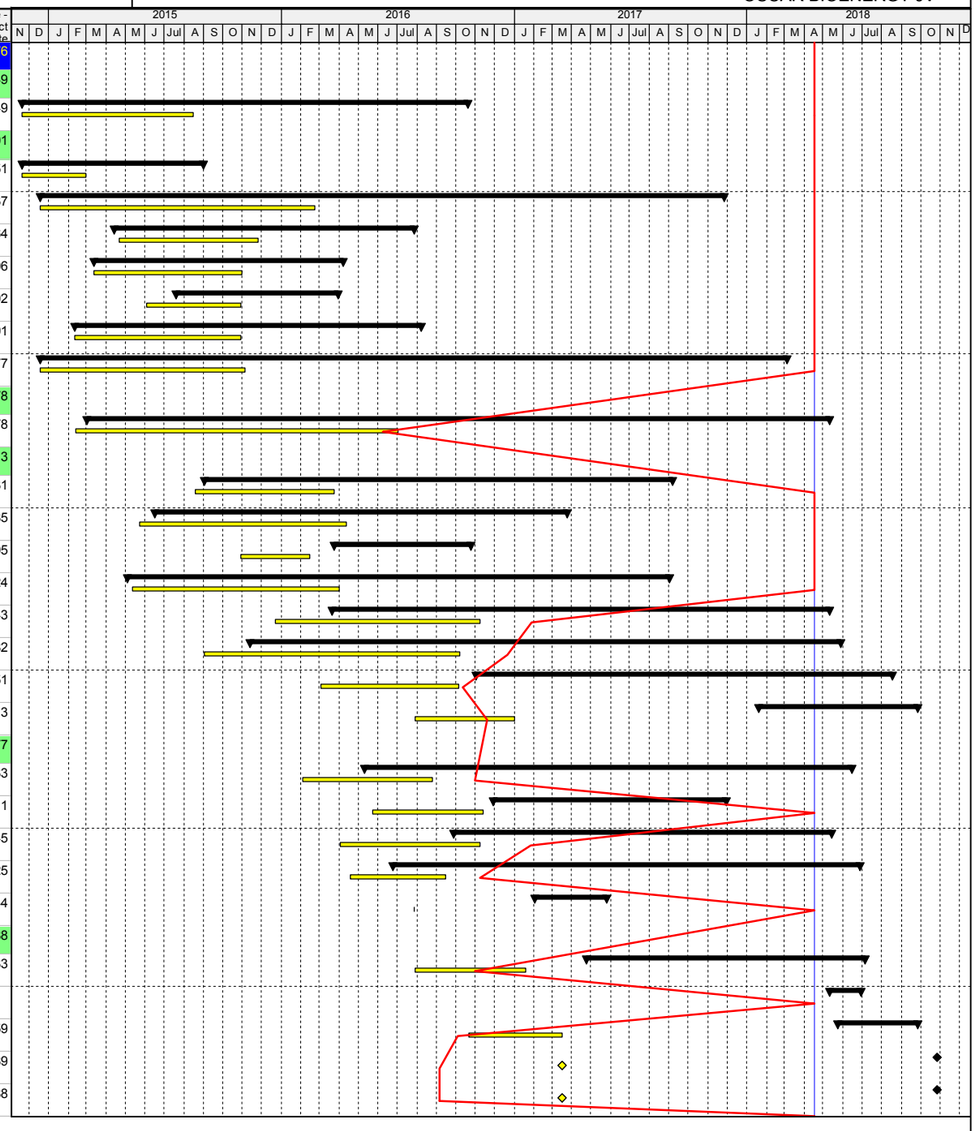
Environmental Protection Department
of the HKSAR

Contract No. EP/SP/61/10
Organic Resources Recovery Centre (Phase 1)

Executive Summary Programme Progress Updated on 17-Apr-18

OSCAR BIOENERGY JV

#	Activity ID	Activity Name	BL Project Duration	BL Project Start	BL Project Finish	Remaining Duration	Start	Finish	% Complete	Variance - BL Project Finish Date
1		***Contract No. EP/SP/61/10 - The Design & Construction Works***	688	20-Nov-14	17-Mar-17	159	20-Nov-14 A	27-Oct-18		-476
2		***Preliminary and Site Establishment***	217	20-Nov-14	15-Aug-15	0	20-Nov-14 A	19-Oct-16 A		-349
3	ESum110	Preliminary and Site Establishment	217	20-Nov-14	15-Aug-15	0	20-Nov-14 A	19-Oct-16 A	100%	-349
4		***Design***	372	20-Nov-14	23-Feb-16	0	20-Nov-14 A	05-Mar-18 A		-601
5	ESum120	Design Criteria and Design Preparation	80	20-Nov-14	27-Feb-15	0	20-Nov-14 A	01-Sep-15 A	100%	-151
6	ESum130	Detailed Design Submission (DDS) - General, Civil, ABWF and Landscape	289	19-Dec-14	23-Feb-16	0	18-Dec-14 A	27-Nov-17 A	100%	-437
7	ESum132	Detailed Design Submission (DDS) - Building 1	151	21-Apr-15	25-Nov-15	0	13-Apr-15 A	27-Jul-16 A	100%	-164
8	ESum134	Detailed Design Submission (DDS) - Building 2	158	12-Mar-15	30-Oct-15	0	12-Mar-15 A	07-Apr-16 A	100%	-106
9	ESum136	Detailed Design Submission (DDS) - Building 3	103	03-Jun-15	29-Oct-15	0	20-Jul-15 A	30-Mar-16 A	100%	-102
10	ESum138	Detailed Design Submission (DDS) - Auxilliary Buildings & Facilities	177	10-Feb-15	29-Oct-15	0	11-Feb-15 A	08-Aug-16 A	100%	-191
11	ESum140	Detailed Design Submission (DDS) - E&M and BS	216	18-Dec-14	04-Nov-15	0	18-Dec-14 A	05-Mar-18 A	100%	-577
12		***Procurement***	507	12-Feb-15	02-Jul-16	25	01-Mar-15 A	11-May-18		-678
13	ESum150	Procurement, Manufacturing, F.A.T., Shipment & Delivery of E&M Systems Equipment	507	12-Feb-15	02-Jul-16	25	01-Mar-15 A	11-May-18	99.94%	-678
14		***Construction***	489	13-May-15	31-Dec-16	135	04-May-15 A	26-Sep-18		-513
15	ESum160	Construction of Building #1 (Waste Receiving, Pre-treatment & Administration)	178	19-Aug-15	23-Mar-16	0	02-Sep-15 A	06-Sep-17 A	100%	-431
16	ESum170	Construction of Building #2 (Composting & Maturation, and Link Bridge)	262	23-May-15	11-Apr-16	0	16-Jun-15 A	24-Mar-17 A	100%	-285
17	ESum175	Construction of Building #3 (Energy Centre)	87	30-Oct-15	15-Feb-16	0	24-Mar-16 A	24-Oct-16 A	100%	-205
18	ESum180	Construction of Auxiliary Buildings & Facilities	263	13-May-15	31-Mar-16	0	04-May-15 A	02-Sep-17 A	100%	-424
19	ESum190	ABWF, Finishing and Fitting-out Works to Building #1, #2, #3 and Auxiliary Buildings & Facilities (excl. EEC)	259	23-Dec-15	08-Nov-16	21	21-Mar-16 A	11-May-18	97.1%	-443
20	ESum200	Sitewide, Boundary Wall and Roadworks	326	02-Sep-15	07-Oct-16	34	13-Nov-15 A	28-May-18	98.5%	-482
21	ESum210	Statutory and Utilities Works (excl. Lifting Platform)	148	04-Mar-16	06-Oct-16	102	02-Nov-16 A	17-Aug-18	99.4%	-551
22	ESum215	Green Roof and Landscaping	129	29-Jul-16	31-Dec-16	135	20-Jan-18 A	26-Sep-18	3%	-513
23		***E&M and Building Services Installation***	229	04-Feb-16	12-Nov-16	59	11-May-16 A	27-Jun-18		-477
24	ESum220	E&M Installation - Mechanical	164	04-Feb-16	25-Aug-16	50	11-May-16 A	15-Jun-18	99.6%	-533
25	ESum222	E&M Installation - Piping	144	24-May-16	12-Nov-16	0	28-Nov-16 A	30-Nov-17 A	100%	-311
26	ESum224	E&M Installation - Electrical, Instrumentation & Control	181	02-Apr-16	08-Nov-16	23	28-Sep-16 A	14-May-18	99.9%	-445
27	ESum226	Building Services Installation (excl. EEC)	125	18-Apr-16	14-Sep-16	59	24-Jun-16 A	27-Jun-18	86.9%	-525
28	ESum230	Energisation of Switchboards / MCC with SAT	1	28-Jul-16	28-Jul-16	0	02-Feb-17 A	26-May-17 A	100%	-244
29		***Testing & Commissioning and Completion*** *Note	232	29-Jul-16	17-Mar-17	193	24-Apr-17 A	30-Dec-18		-588
30	ESum240	Pre-Commissioning	144	29-Jul-16	19-Jan-17	81	24-Apr-17 A	06-Jul-18	61.2%	-533
31	ESum241	System Commissioning	0			50	11-May-18	29-Jun-18	0%	
32	ESum250	Process Commissioning, Performance & Acceptance Testing	119	22-Oct-16	16-Mar-17	127	23-May-18	26-Sep-18	0%	-559
33	KD100360	Completion of the Design and the Works including Testing and Commissioning (Extended Completion Date: 10-Jun-2017 noon)	0		16-Mar-17	0	1-May-18	15-Mar-19[a]	0%	-589
34	KD100380	Commencement of the Operation	0	17-Mar-17		0	4-Dec-18[b]		0%	-588

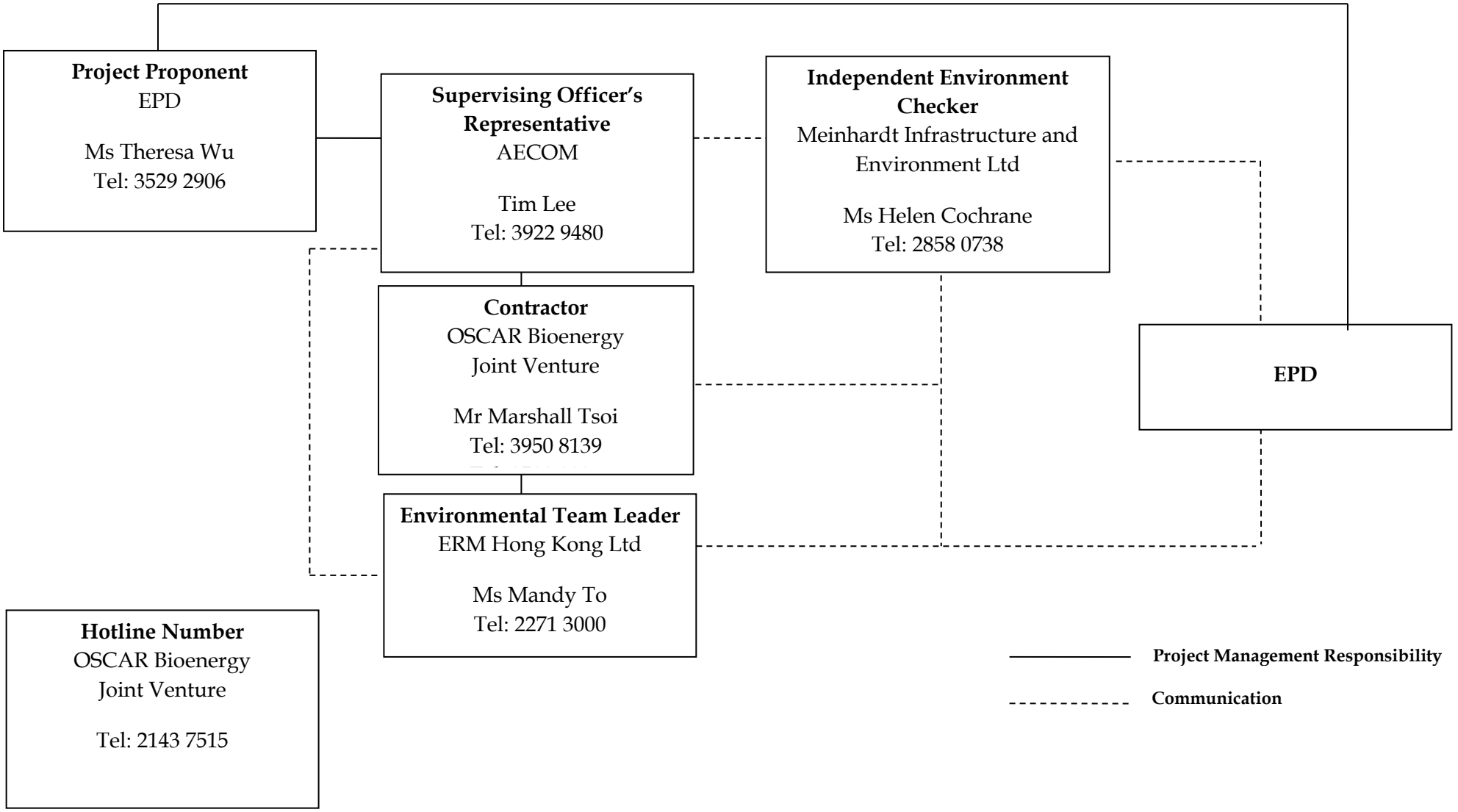


a: The T&C is in progress.
b: The confirmation for substantial completion has been dated to 3 December 2018.

Annex D

Project Organization Chart with Contact Details

Project Organization During Construction Phase (with contact details)



Annex E

Implementation Schedule of Mitigation Measures

Annex E Summary of Mitigation Measures Implementation Schedule

EIA Ref.	EM&A Log Ref.	Environmental Protection Measures	Location/ Timing	Status
Summary of Environmental Mitigation Measures in the EIA and EM&A Manual				
A. Air Quality				
3.73	2.5	<u>*Air Pollution Control (Construction Dust) Regulation & Good Site Practices*</u> • Use of regular watering, with complete coverage, to reduce dust emissions from exposed site surfaces and unpaved roads, particularly during dry weather. • Use of frequent watering for particularly dusty construction areas and areas close to ASRs. • Side enclosure and covering of any aggregate or dusty material storage piles to reduce emissions. Where this is not practicable owing to frequent usage, watering should be applied to aggregate fines. • Open stockpiles should be avoided or covered. Where possible, prevent placing dusty material storage piles near ASRs. • Tarpaulin covering of all dusty vehicle loads transported to, from and between site locations. • Establishment and use of vehicle wheel and body washing facilities at the exit points of the site. • Provision of wind shield and dust extraction units or similar dust mitigation measures at the loading points, and use of water sprinklers at the loading area where dust generation is likely during the loading process of loose material, particularly in dry seasons/ periods. • Imposition of speed controls for vehicles on unpaved site roads. 8 kilometers per hour is the recommended limit. • Where possible, routing of vehicles and positioning of construction plant should be at the maximum possible distance from ASRs. • Every stock of more than 20 bags of cement or dry pulverised 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.	Construction Site / During Construction Period	√
B. Hazard to Life				
4.102	3.3	<u>*Construction Phase*</u> • The number of workers on site during construction stage should be kept at the same level as	Construction Site / During Construction Period	√

EIA Ref.	EM&A Log Ref.	Environmental Protection Measures	Location/ Timing	Status
		the assessment. • Construction works should be suspended when delivery of chlorine takes place. • 3m high fence should be constructed along the boundary facing the SHWWTW. • Emergency evacuation procedures should be formulated and the Contractor should ensure all workers on site should be familiar with these procedures as well as the route to escape in case of gas release incident. Relevant Departments, such as Fire Services Department (FSD), should be consulted during the development of Emergency procedures. Diagram showing the escape routes to a safe place should be posted in the site notice boards and at the entrance/exit of site. A copy of the latest version emergency procedures should be dispatched to Tung Chung Fire Station for reference once available. • The emergency procedures should specify means of providing a rapid and direct warning (e.g. Siren and Flashing Light) to construction workers in the event of chlorine gas release in the SHWWTW. • The Contractor should establish a communication channel with the SHWWTW operation personnel and FSD during construction stage. In case of any hazardous incidents in the treatment works, operation personnel of SHWWTW should advise the Contractor to inform construction workers to proceed with emergency procedure. The Contractor should appoint a Liaison Officer to communicate with FSD Incident Commander on site in case of emergency. • Introduction training should be provided to any staff before carryout construction works at the Project site. • Periodic drills should be coordinated and conducted to ensure all construction personnel are familiar with the emergency procedures. Upon completion of the drills, a review on every step taken should be conducted to identify area of improvement. Prior notice of periodic drills should be given to Station Commander of Tung Chung Fire Station. Joint operational exercise with FSD and SHWWTW is recommended.		
C. Water Quality				
5.44	4.5	*Construction site run-off and general construction activities:* The mitigation measures as outlined in the ProPECC PN 1/94 Construction Site Drainage should be adopted where applicable.	Construction Site / During Construction Period	√
5.45	4.5	*Excavation of Soil Materials* The construction programme should be properly planned to minimise soil excavation, if any, in rainy seasons. This prevents soil erosion from exposed soil surfaces. Any exposed soil surfaces should also be properly protected to minimise dust emission. In areas where a large amount of exposed soils exist, earth bunds or sand bags should be provided. Exposed stockpiles should be covered with tarpaulin or impervious sheets at all times. The stockpiles of materials should be	Construction Site / During Construction Period	√

EIA Ref.	EM&A Log Ref.	Environmental Protection Measures	Location/ Timing	Status
		placed at locations away from any stream courses so as to avoid releasing materials into the water bodies. Final surfaces of earthworks should be compacted and protected by permanent work.		
5.46	4.5	*Accidental spillage of chemicals:* Contractor must register as a chemical waste producer if chemical wastes would be produced from the construction activities. The Waste Disposal Ordinance (Cap 354) and its subsidiary regulations in particular the Waste Disposal (Chemical Waste) (General) Regulation should be observed and complied with for control of chemical wastes.	Construction Site / During Construction Period	√
5.47	4.5	Maintenance of vehicles and equipments involving activities with potential for leakage and spillage should only be undertaken within the areas which appropriately equipped to control these discharges.	Construction Site / During Construction Period	√
5.48	4.5	Oils and fuels should only be used and stored in designated areas which have pollution prevention facilities. All fuel tanks and storage areas should be sited on sealed areas in order to prevent spillage of fuels and solvents to the nearby watercourses. All waste oils and fuels should be collected in designated tanks prior to disposal.	Construction Site / During Construction Period	√
5.49	4.5	Disposal of chemical wastes should be carried out in compliance with the Waste Disposal Ordinance. The Code of Practice on the Packaging, Labelling and Storage of Chemical Wastes published under the Waste Disposal Ordinance details the requirements to deal with chemical wastes. General requirements are given as follows: • Suitable containers should be used to hold the chemical wastes to avoid leakage or spillage during storage, handling and transport. • Chemical waste containers should be suitably labeled, to notify and warn the personnel who are handling the wastes, to avoid accidents. • Storage area should be selected at a safe location on site and adequate space should be allocated to the storage area.	Construction Site / During Construction Period	<>
5.50	4.5	Construction solid waste, debris and rubbish on site should be collected, handled and disposed of properly to avoid entering to the nearby watercourses. Stockpiles of cement and other construction materials should be kept covered when not being used. Rubbish and litter from construction sites should also be collected to prevent spreading of rubbish and litter from the site area. It is recommended to clean the construction sites on a regular basis.	Construction Site / During Construction Period	√
5.51	4.5	*Sewage Effluent*	Work site/During the	√

EIA Ref.	EM&A Log Ref.	Environmental Protection Measures	Location/ Timing	Status
		The presence of construction workers generates sewage. It is recommended to provide sufficient chemical toilets in the works areas. The toilet facilities should be more than 30m from any watercourse. A licensed waste collector should be deployed to clean the chemical toilets on a regular basis.	construction period	
5.52	4.5	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 the construction site can provide an effective control of any malpractices and can achieve continual improvement of environmental performance on site.	Work Site / During Construction Period	√
5.53	4.5	<u>*Nullah Decking*</u> To minimize the potential water quality impacts from the nullah reconstruction works, the practices outlined below should be adopted where applicable: • The proposed works should be carried out within the dry season between October and March when the flow in the open nullah is low. • The use of less or smaller construction plants may be specified to reduce the disturbance to the nullah bed. • Temporary storage of materials (e.g. equipment, filling materials, chemicals and fuel) and temporary stockpile of construction materials should be located well away from the nullah and any water courses during carrying out of the construction works. • Stockpiling of construction materials and dusty materials should be covered and located away from the nullah any water courses. • Construction debris and spoil should be covered up and/or disposed of as soon as possible to avoid being washed into the nullah and nearby water receivers. • Construction activities, which generate large amount of wastewater, should be carried out in a distance away from the nullah, where practicable. • Construction effluent, site run-off and sewage should be properly collected and/or treated. • Any works site inside the nullah should be temporarily isolated, such as by placing of sandbags or silt curtains with lead edge at bottom and properly supported props to prevent adverse impact on the water quality. • Proper shoring may need to be erected in order to prevent soil/mud from slipping into the nullah and nearby watercourse. • Supervisory staff should be assigned to station	Work Site / During Construction Period	N/A
D. Waste Management				
6.41	5.4	<u>*Good Site Practices*</u>	Work Site / During	<>

EIA Ref.	EM&A Log Ref.	Environmental Protection Measures	Location/ Timing	Status
		Recommendations for good site practices during the construction phase would include: • Obtain relevant waste disposal permits from appropriate authorities, in accordance with the Waste Disposal Ordinance (Cap. 354) and subsidiary Regulations and the Land (Miscellaneous Provisions) Ordinance (Cap. 28); • Provide staff training for proper waste management and chemical handling procedures; • Provide sufficient waste disposal points and regular waste collection; • Provide appropriate measures to minimize windblown litter and dust during transportation of waste by either covering trucks or by transporting wastes in enclosed containers; • Carry out regular cleaning and maintenance programme for drainage systems, sumps and oil interceptors; • Separate chemical wastes for special handling and disposed of to licensed facility for treatment; and • Employ licensed waste collector to collect waste.	Construction Period	
6.42	5.5	*Waste Reduction Measures* Waste reduction is best achieved at the planning and design stage, as well as by ensuring the implementation of good site practices. Recommendations to achieve waste reduction include: • Design foundation works that could minimise the amount of excavated material to be generated; • Provide training to workers on the importance of site cleanliness and appropriate waste management procedures, including waste reduction, reuse and recycling; • Sort out demolition debris and excavated materials from demolition works to recover reusable/ recyclable portions (i.e. soil, broken concrete, metal etc.); • Segregate and store different types of waste in different containers, skips or stockpiles to enhance reuse or recycling of materials and their proper disposal; • Encourage the collection of aluminium cans by providing separate labelled bins to enable this waste to be segregated from other general refuse generated by the workforce; and • Plan and stock construction materials carefully to minimize the amount of waste to be generated and to avoid unnecessary generation of waste.	Work Site/During Design & Construction Period	√
6.44	5.7	*Excavated and C&D Materials* In order to minimise the impact resulting from collection and transportation of C&D material for off-site disposal, the excavated material arising from site formation and foundation works should be reused on-site as backfilling material and for landscaping works as far as practicable. Other mitigation requirements are listed below: • A WMP, which becomes part of the Environmental Management Plan (EMP), should be prepared in accordance with ETWB TCW No.19/2005;	Work Site/During Design & Construction Period	√

EIA Ref.	EM&A Log Ref.	Environmental Protection Measures	Location/ Timing	Status
		• A recording system for the amount of wastes generated, recycled and disposed of (including the disposal sites) should be adopted for easy tracking; and • In order to monitor the disposal of excavated and C&D material at public filling facilities and landfills and to control fly-tipping, a trip-ticket system should be adopted (refer to ETWB TCW No. 31/2004).		
6.45 – 6.46	5.8 – 5.9	An EMP should be prepared and implemented in accordance with ETWB TCW No. 19/2005 which describes the arrangements for avoidance, reuse, recovery, recycling, storage, collection, treatment and disposal of different categories of waste to be generated from construction activities. The EMP should be submitted to the Supervising Officer (SO) and Supervising Officer's Representative (SOR) for approval. The EMP should be reviewed regularly and updated, preferably on a monthly basis. A system should be devised to work for on-site sorting of excavated and C&D materials and promptly removing all sorted and process materials arising from the construction activities to minimize temporary stockpiling on-site. The system should be included in the EMP identifying the source of generation, estimated quantity, arrangement for on-site sorting, collection, temporary storage areas and frequency of collection by recycling Contractors or frequency of removal off-site.	Work Site/During Design & Construction Period	√
6.47	5.10	*Chemical Waste* Should chemical wastes be produced at the construction site, the Contractor would be required to register with EPD as a Chemical Waste Producer and to follow the guidelines stated in the Code of Practice on the Packaging, Labelling and Storage of Chemical Wastes. Good quality containers compatible with the chemical wastes should be used, and incompatible chemicals should be stored separately. Appropriate labels should be securely attached on each chemical waste container indicating the corresponding chemical characteristics of the chemical waste (such as explosive, flammable, oxidizing, irritant, toxic, harmful, or corrosive). The Contractor should employ a licensed collector to transport and dispose of the chemical wastes, to either the CWTC in Tsing Yi, or any other licensed facilities, in accordance with the Waste Disposal (Chemical Waste) General) Regulation.	Work Site / During Construction Period	√
6.48	5.11	*General Refuse* General refuse should be stored in enclosed bins or compaction units separated from C&D material. A licensed waste collector should be employed by the contractor to remove general refuse from the site, separately from C&D material. Preferably an enclosed and covered area should be provided to reduce the occurrence of 'wind blown' light material.	Work Site / During Construction Period	√
E. Landscape and Visual				
7.99 & Table 7.7	Table 6.1	Construction Phase Topsoil, where identified, should be stripped and stored for re-use in the construction of the	Work Site / During Construction Period	√

EIA Ref.	EM&A Log Ref.	Environmental Protection Measures	Location/ Timing	Status
		soft landscape works, where practical ・Compensatory tree planting should be provided to compensate for felled trees. - Compensation tree species shall be chosen from both indigenous and ornamental species - Compensatory tree planting quantities shall be as per DLO approved requirement. ・Control of night-time lighting ・Erection of decorative screen hoarding compatible with the surrounding setting		
F. Noise				
8.25	7.3	Good Site Practice: ・Only well-maintained plant should be operated on-site and plant should be serviced regularly during the construction program; ・Mobile plant, if any, should be sited as far from noise sensitive receivers (NSRs) as possible; ・Machines and plant (such as trucks) that may be in intermittent use should be shut down between work 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; and ・Material stockpiles and other structures should be effectively utilized, wherever practicable, in screening noise from on-site construction activities.	Work site/During Design & Construction Stages	√

Remark:

√	Compliance of Mitigation Measures
<>	Compliance of Mitigation but need improvement
x	Non-compliance of Mitigation Measures
▲	Non-compliance of Mitigation Measures but rectified by OSCAR Bioenergy JV
Δ	Deficiency of Mitigation Measures but rectified by OSCAR Bioenergy JV
N/A	Not Applicable in Reporting Period

Annex F

Waste Flow Table

No. EP/SP/61/10 of Organic Resources Recovery Centre (Phase I)
Monthly Summary Waste Flow Table

Month	Actual Quantities of Inert C&D Materials Generated					Actual Quantities of Non-inert C&D Materials (Construction Waste) Generated				
	Total Quantity Generated	Reused in the Contract	Reused in other Projects	Hard Rocks & Large Broken Concrete	Disposed as Public Fill	Metals (see Note 1)	Paper/ cardboard packaging (see Note 1)	Plastics (see Note 2)	Chemical Waste	Others, e.g. general refuse (see Note 3)
	tonne	tonne	tonne	tonne	tonne	kilogram	kilogram	kilogram	Litre	tonne
May 2015	29.58	0.00	0.00	0.00	29.58	0.00	0.00	0.00	0.00	0.00
June 2015	2226.90	0.00	0.00	0.00	2226.90	0.00	0.00	0.00	0.00	9.66
July 2015	2832.27	0.00	0.00	0.00	2832.27	0.00	0.00	0.00	0.00	33.68
August 2015	6657.25	0.00	0.00	0.00	6657.25	0.00	20.00	0.00	0.00	55.06
September 2015	5467.05	0.00	0.00	0.00	5467.05	3480.00	0.00	0.00	0.00	83.81
October 2015	5419.04	0.00	0.00	0.00	5419.04	18710.00	0.00	0.00	0.00	20.45
November 2015	1375.26	0.00	0.00	0.00	1375.26	21610.00	0.00	0.00	0.00	17.38
December 2015	2199.56	75.28	0.00	0.00	2124.28	0.00	41.00	0.00	0.00	21.83
January 2016	4601.43	0.00	0.00	0.00	4601.43	18140.00	50.00	0.00	640.00	20.86
February 2016	4167.01	0.00	0.00	0.00	4167.01	510.00	79.00	0.00	0.00	16.57
March 2016	299.92	41.28	0.00	0.00	258.64	22320.00	75.00	0.00	0.00	22.69
April 2016	3186.37	98.37	0.00	0.00	3088.00	60690.00	77.00	0.00	255.00	37.63
May 2016	1612.33	63.41	0.00	0.00	1548.92	13490.00	35000.00	0.00	0.00	40.76
June 2016	1144.73	30.43	0.00	0.00	1114.30	14600.00	120.00	0.00	0.00	58.34
July 2016	662.76	0.00	0.00	0.00	662.76	13370.00	0.00	0.00	0.00	40.48
August 2016	391.88	0.00	0.00	0.00	391.88	18660.00	84.00	0.00	0.00	61.91
September 2016	324.35	0.00	0.00	0.00	324.35	56800.00	2780.00	0.00	0.00	138.25
October 2016	1561.82	39.00	0.00	0.00	1522.82	40000	9.30	0.00	700.00	114.47
November 2016	897.23	507.94	00.00	0.00	389.76	0.00	123.00	0.00	0.00	154.22
December 2016	2477.95	489.00	0.00	0.00	1988.95	2960.00	93.00	0.00	0.00	136.80
January 2017	2150.92	503.60	0.00	0.00	1647.32	31240.00	21051.00	3630.00	0.00	127.43

Month	Actual Quantities of Inert C&D Materials Generated					Actual Quantities of Non-inert C&D Materials (Construction Waste) Generated				
	Total Quantity Generated	Reused in the Contract	Reused in other Projects	Hard Rocks & Large Broken Concrete	Disposed as Public Fill	Metals (see Note 1)	Paper/ cardboard packaging (see Note 1)	Plastics (see Note 2)	Chemical Waste	Others, e.g. general refuse (see Note 3)
	tonne	tonne	tonne	tonne	tonne	kilogram	kilogram	kilogram	Litre	tonne
February 2017	553.80	440.00	0.00	0.00	113.80	14940.00	18820.00	2880.00	460.00	83.46
March 2017	665.93	460.00	0.00	0.00	205.93	11660.00	29370.00	4400.00	660.00	99.59
April 2017	553.41	220.00	0.00	0.00	333.41	8600.00	25610.00	520.00	700.00	81.83
May 2017	388.82	211.00	0.00	0.00	177.82	1090.00	64.00	0.00	0.00	109.10
June 2017	352.12	104.00	0.00	0.00	248.12	1800.00	16400.00	12030.00	700.00	70.58
July 2017	400.72	165.00	0.00	0.00	235.72	6500.00	12330.00	4690.00	0.00	52.20
August 2017	589.89	202.00	0.00	0.00	387.89	23330.00	27079.00	5220.00	700.00	69.52
September 2017	3347.18	1364.00	0.00	0.00	1983.18	33379.00	29426.00	3990.00	0.00	62.82
October 2017	2384.86	984.00	0.00	0.00	1400.86	11842.00	34071.00	5230.00	0.00	74.13
November 2017	797.42	384.18	0.00	0.00	413.24	20210.00	25225.00	4030.00	0.00	163.03
December 2017	106.32	51.00	0.00	0.00	55.32	17650.00	19520.00	3210.00	0.00	82.23
January 2018	283.65	125.83	0.00	0.00	157.82	12900.00	15600.00	12330.00	0.00	30.93
February 2018	122.31	55.70	0.00	0.00	66.61	10950.00	13260.00	6570.00	0.00	16.95
March 2018	217.06	99.80	0.00	0.00	117.26	12260.00	12120.00	5960.00	0.00	32.53
April 2018	1118.36	460.58	0.00	0.00	657.78	16320.00	12590.00	6280.00	0.00	33.90
May 2018	475.54	198.85	0.00	0.00	276.69	15230.00	11024.00	0.00	0.00	40.02
June 2018	684.10	256.50	0.00	0.00	427.60	14320.00	10260.00	2630.00	0.00	43.01
July 2018	93.99	42.00	0.00	0.00	51.99	11220.00	6200.00	0.00	0.00	59.77
August 2018	528.56	225.00	0.00	0.00	303.56	13620.00	33400.00	26760.00	0.00	44.50
September 2018	765.70	325.00	0.00	0.00	440.70	10600.00	4500.00	0.00	0.00	41.82
October 2018	0.00	0.00	0.00	0.00	0.00	0.00	2330.00	0.00	0.00	109.49
November 2018	77.71	0.00	0.00	0.00	77.71	0.00	0.00	0.00	0.00	30.18
December 2018	88.43	0.00	0.00	0.00	88.43	0.00	0.00	0.00	0.00	5.72
January 2019	21.13	0.00	0.00	0.00	21.13	0.00	0.00	0.00	1880.00	4.55

Month	Actual Quantities of Inert C&D Materials Generated					Actual Quantities of Non-inert C&D Materials (Construction Waste) Generated				
	Total Quantity Generated	Reused in the Contract	Reused in other Projects	Hard Rocks & Large Broken Concrete	Disposed as Public Fill	Metals (see Note 1)	Paper/ cardboard packaging (see Note 1)	Plastics (see Note 2)	Chemical Waste	Others, e.g. general refuse (see Note 3)
	tonne	tonne	tonne	tonne	tonne	kilogram	kilogram	kilogram	Litre	tonne
February 2019	326.44	0.00	0.00	0.00	326.44	0.00	0.00	0.00	0.00	26.69
March 2019	190.4	0.00	0.00	0.00	190.40	0.00	0.00	0.00	0.00	16.45
Total	64836.84	8222.28	0.00	0.00	56614.56	605001.00	418801.30	110360.00	6695.00	2697.28

Notes: (1) Metal and paper/cardboard packaging were collected by recycler for recycling.
(2) Plastics refer to plastic bottles/containers, plastic sheets/foam from packaging material collected by recycler for recycling.
(3) General refuse was disposed of at NENT by subcontractors.

Annex G

Environmental Complaint, Environmental Summons and Persecution Log

Annex G Cumulative Complaint and Summons/Prosecutions Log

Reporting Month	Number of Complaints in Reporting Month	Number of Summons/Prosecutions in Reporting Month
May 2015	0	0
June 2015	0	0
July 2015	0	0
August 2015	0	0
September 2015	0	0
October 2015	0	0
November 2015	0	0
December 2015	0	0
January 2016	0	0
February 2016	0	0
March 2016	0	0
April 2016	0	0
May 2016	0	0
June 2016	0	0
July 2016	0	0
August 2016	0	0
September 2016	0	0
October 2016	0	0

Reporting Month	Number of Complaints in Reporting Month	Number of Summons/Prosecutions in Reporting Month
November 2016	0	0
December 2016	0	0
January 2017	0	0
February 2017	0	0
March 2017	0	0
April 2017	0	0
May 2017	0	0
June 2017	0	0
July 2017	0	0
August 2017	0	0
September 2017	0	0
October 2017	0	0
November 2017	0	0
December 2017	0	0
January 2018	0	0
February 2018	0	0
March 2018	0	0
April 2018	0	0
May 2018	0	0
June 2018	0	0

Reporting Month	Number of Complaints in Reporting Month	Number of Summons/Prosecutions in Reporting Month
July 2018	0	0
August 2018	0	0
September 2018	1	0
October 2018	0	0
November 2018	0	0
December 2018	0	0
January 2019	0	0
February 2019	0	0
March 2019	0	0
Overall Total	**1**	**0**

Annex H

Odour Monitoring Result

Annex H1

Odour Patrol Result

Organic Resources Recovery Centre (Phase 1)
Odour Patrol Record Log Sheet

OSCAR BIOENERGY

Date	1 / 3 / 2019
Type of Patrol	Weekly Patrol / ~~Monthly Independent Patrol~~ /
Weather Condition	Sunny / (Cloudy) / Windy / Humid / Foggy /
Average Temperature (°C)	23.1
Average Relative Humidity (%)	77.8

Monitoring Location	Time	Odour Intensity	Odour Characteristics	Duration	Possible Source of Odour	Remark
Location 1	10:37	0 / 1 / 2 / 3 / 4	P1:0 P2:1 Biogas	(Intermittent) / Continuous	Biogas Holder	
Location 2	10:38	(0) / 1 / 2 / 3 / 4		Intermittent / Continuous		
Location 3	10:39	(0) / 1 / 2 / 3 / 4		Intermittent / Continuous		
Location 4	10:42	(0) / 1 / 2 / 3 / 4		Intermittent / Continuous		
Location 5	10:44	0 / (1) / 2 / 3 / 4	Grass	(Intermittent) / Continuous	Grass	
Location 6	10:46	0 / 1 / 2 / 3 / 4	P1:1 P2:0 Biogas	(Intermittent) / Continuous	Biogas Holder	
Location 7	10:49	0 / 1 / 2 / 3 / 4	P1:1 P2:0 Biogas	(Intermittent) / Continuous	Biogas Holder	
Location 8	10:51	(0) / 1 / 2 / 3 / 4		Intermittent / Continuous		

Remark

	EPD Representative	Employer Representative	Independent Odour Patrol Team	Independent Odour Patrol Team	OSCAR Bioenergy JV
Name	FIONA LAM		Edwin Wong	HO Tsz kin	Sarah HO
Signature	F/S	NA			Sarah
Date	1/3/2019		1/3/2019	1/3/2019	1/3/2019

Example of Odour Characteristics	Example of Possible Source of Odour
Biogas / Compost / sewage /rotten-egg smell/ decayed vegetables/ Diesel / ammoniacal/ dischargeable odour/ putrefaction/ sharp/ pungent/ fish/ irritating/ fruit/ vinegar	*PRVs of Gas Holder / Sediment/ Water / SSOW Trucks Doors Opened / Stack emission / Sewage / food waste/ Pretreatment / Machine Operation / Material / others /*

Organic Resources Recovery Centre (Phase 1)
Odour Patrol Record Log Sheet

OSCAR BIOENERGY

Date	1 / 3 / 2019
Type of Patrol	Weekly Patrol / ~~Monthly Independent Patrol~~ /
Weather Condition	Sunny / Cloudy / Windy / Humid / Foggy /
Average Temperature (℃)	22.5
Average Relative Humidity (%)	80.2

Monitoring Location	Time	Odour Intensity	Odour Characteristics	Duration	Possible Source of Odour	Remark
Location 1	17:05	0 / (1) / 2 / 3 / 4	Biogas	Intermittent / (Continuous)	Biogas Holder	
Location 2	17:06	0 / (1) / 2 / 3 / 4	Biogas	Intermittent / (Continuous)	Biogas Holder	
Location 3	17:07	0 / (1) / 2 / 3 / 4	Biogas	Intermittent / (Continuous)	Biogas Holder	
Location 4	17:09	(0) / 1 / 2 / 3 / 4		Intermittent / Continuous		
Location 5	17:11	0 / (1) / 2 / 3 / 4	Grass	Intermittent / (Continuous)	Grass	
Location 6	17:13	(0) / 1 / 2 / 3 / 4		Intermittent / Continuous		
Location 7	17:16	0 / (1) / 2 / 3 / 4	Biogas	Intermittent / (Continuous)	Biogas Holder	
Location 8	17:17	0 / 1 / 2 / 3 / 4	P1: 1 P2: 0 Rubbish	(Intermittent) / Continuous	Rubbish Truck	

Remark

	EPD Representative	Employer Representative	Independent Odour Patrol Team	Independent Odour Patrol Team	OSCAR Bioenergy JV
Name	FIONA LAM		Edwin Wong	Ho Tsz kin	Sarah Ho
Signature	Fiona	NA	Ew		Sarah.
Date	1/3/2019		1-3-2019	1-3-2019	1/3/2019

Example of Odour Characteristics	Example of Possible Source of Odour
Biogas / Compost / sewage /rotten-egg smell/ decayed vegetables/ Diesel / ammoniacal/ dischargeable odour/ putrefaction/ sharp/ pungent/ fish/ irritating/ fruit/ vinegar	*PRVs of Gas Holder / Sediment/ Water / SSOW Trucks Doors Opened / Stack emission / Sewage / food waste/ Pretreatment / Machine Operation / Material / others /*

Organic Resources Recovery Centre (Phase 1)
Odour Patrol Record Log Sheet

OSCAR BIOENERGY

Date	4 / 3 / 2019
Type of Patrol	(Weekly Patrol) / Monthly Independent Patrol /
Weather Condition	(Sunny) / Cloudy / Windy / Humid / Foggy /
Average Temperature (℃)	23.8
Average Relative Humidity (%)	66

Monitoring Location	Time	Odour Intensity	Odour Characteristics	Duration	Possible Source of Odour	Remark
Location 1	11:07	0 / (1) / 2 / 3 / 4	Biogas	~~Intermittent~~ / Continuous	Biogas Holder	
Location 2	11:09	0 / (1) / 2 / 3 / 4	Biogas	Intermittent / (Continuous)	Biogas Holder	
Location 3	11:10	0 / (1) / 2 / 3 / 4	Biogas	~~Intermittent~~ / Continuous	Biogas Holder	
Location 4	11:13	(0) / 1 / 2 / 3 / 4		Intermittent / Continuous		
Location 5	11:15	(0) / 1 / 2 / 3 / 4		Intermittent / Continuous		
Location 6	11:19	0 / (1) / 2 / 3 / 4	Biogas	~~Intermittent~~ / Continuous	Biogas Holder	
Location 7	11:25	0 / (1) / 2 / 3 / 4	Diesel	Intermittent / (Continuous)	Machine	
Location 8	11:26	(0) / 1 / 2 / 3 / 4		Intermittent / Continuous		

Remark

	EPD Representative	Employer Representative	Independent Odour Patrol Team	Independent Odour Patrol Team	OSCAR Bioenergy JV
Name	TESS CHAN				Sarah HO
Signature	Tess	NA	NA	NA	Sarah
Date	04 MAR 2019				4/3/2019

Example of Odour Characteristics	Example of Possible Source of Odour
Biogas / Compost / sewage /rotten-egg smell/ decayed vegetables/ Diesel / ammoniacal/ dischargeable odour/ putrefaction/ sharp/ pungent/ fish/ irritating/ fruit/ vinegar	*PRVs of Gas Holder / Sediment/ Water / SSOW Trucks Doors Opened / Stack emission / Sewage / food waste/ Pretreatment / Machine Operation / Material / others /*

Organic Resources Recovery Centre (Phase 1)
Odour Patrol Record Log Sheet

OSCAR BIOENERGY

Date	8 / 3 / 2019
Type of Patrol	(Weekly Patrol) / Monthly Independent Patrol /
Weather Condition	Sunny / (Cloudy) / Windy / Humid / Foggy /
Average Temperature (°C)	20.1
Average Relative Humidity (%)	71

Monitoring Location	Time	Odour Intensity	Odour Characteristics	Duration	Possible Source of Odour	Remark
Location 1	10:09	(0) / 1 / 2 / 3 / 4		*Intermittent / Continuous*		
Location 2	10:11	0 / (1) / 2 / 3 / 4	Biogas	(Intermittent) / Continuous	Biogas Holder	
Location 3	10:12	(0) / 1 / 2 / 3 / 4		*Intermittent / Continuous*		
Location 4	10:15	(0) / 1 / 2 / 3 / 4		*Intermittent / Continuous*		
Location 5	10:19	0 / (1) / 2 / 3 / 4	Grass	*Intermittent /* (Continuous)	Grass	
Location 6	10:22	0 / (1) / 2 / 3 / 4	Rubbish	(Intermittent) / Continuous	Unknown source	
Location 7	10:29	0 / (1) / 2 / 3 / 4	Engine	(Intermittent) / Continuous	Truck	
Location 8	10:31	(0) / 1 / 2 / 3 / 4		*Intermittent / Continuous*		

Remark

	EPD Representative	Employer Representative	Independent Odour Patrol Team	Independent Odour Patrol Team	OSCAR Bioenergy JV
Name	FIONA LAM				Sarah HO
Signature	Fiona	NA	NA	NA	Sarah
Date	8/3/2019				8 / 3 / 2019

Example of Odour Characteristics	Example of Possible Source of Odour
Biogas / Compost / sewage /rotten-egg smell/ decayed vegetables/ Diesel / ammoniacal/ dischargeable odour/ putrefaction/ sharp/ pungent/ fish/ irritating/ fruit/ vinegar	*PRVs of Gas Holder / Sediment/ Water / SSOW Trucks Doors Opened / Stack emission / Sewage / food waste/ Pretreatment / Machine Operation / Material / others /*

Organic Resources Recovery Centre (Phase 1)
Odour Patrol Record Log Sheet

OSCAR BIOENERGY

Date	11 / 3 / 2019
Type of Patrol	(Weekly Patrol) / Monthly Independent Patrol /
Weather Condition	(Sunny) / Cloudy / Windy / Humid / Foggy /
Average Temperature (°C)	24.8
Average Relative Humidity (%)	50

Monitoring Location	Time	Odour Intensity	Odour Characteristics	Duration	Possible Source of Odour	Remark
Location 1	14:03	(0) / 1 / 2 / 3 / 4		*Intermittent / Continuous*		
Location 2	14:06	0 / (1) / 2 / 3 / 4	Biogas (strong) wastewater	*Intermittent / Continuous*	Biogas Holder Desulphurization Unit area	
Location 3	14:07	(0) / (1) / 2 / 3 / 4		*Intermittent / Continuous*		
Location 4	14:11	(0) / 1 / 2 / 3 / 4		*Intermittent / Continuous*		
Location 5	14:13	(0) / 1 / 2 / 3 / 4		*Intermittent / Continuous*		
Location 6	14:17	(0) / 1 / 2 / 3 / 4		*Intermittent / Continuous*		
Location 7	14:22	(0) / 1 / 2 / 3 / 4		*Intermittent / Continuous*		
Location 8	14:23	(0) / 1 / 2 / 3 / 4		*Intermittent / Continuous*		

Remark

	EPD Representative	Employer Representative	Independent Odour Patrol Team	Independent Odour Patrol Team	OSCAR Bioenergy JV
Name	FIONA LAM				~~[illegible]~~ Sarah Ho
Signature	Fiona	NA	NA	NA	Sarah
Date	11/3/2019				11/3/2019

Example of Odour Characteristics	Example of Possible Source of Odour
Biogas / Compost / sewage /rotten-egg smell/ decayed vegetables/ Diesel / ammoniacal/ dischargeable odour/ putrefaction/ sharp/ pungent/ fish/ irritating/ fruit/ vinegar	*PRVs of Gas Holder / Sediment/ Water / SSOW Trucks Doors Opened / Stack emission / Sewage / food waste/ Pretreatment / Machine Operation / Material / others /*

Organic Resources Recovery Centre (Phase 1)
Odour Patrol Record Log Sheet

OSCAR BIOENERGY

Date	13 / 3 / 2019
Type of Patrol	(Weekly Patrol) / Monthly Independent Patrol /
Weather Condition	(Sunny) / Cloudy / Windy / Humid / Foggy /
Average Temperature (℃)	26.8
Average Relative Humidity (%)	50

Monitoring Location	Time	Odour Intensity	Odour Characteristics	Duration	Possible Source of Odour	Remark
Location 1	13:31	(0) / 1 / 2 / 3 / 4		*Intermittent / Continuous*		
Location 2	13:33	0 / (1) / 2 / 3 / 4	Biogas	*Intermittent / Continuous*	Biogas Holder	
Location 3	13:34	(0) / 1 / 2 / 3 / 4		*Intermittent / Continuous*		
Location 4	13:36	(0) / 1 / 2 / 3 / 4		*Intermittent / Continuous*		
Location 5	13:38	(0) / 1 / 2 / 3 / 4		*Intermittent / Continuous*		
Location 6	13:41	(0) / 1 / 2 / 3 / 4		*Intermittent / Continuous*		
Location 7	13:44	0 / (1) / 2 / 3 / 4	oil	*Intermittent / Continuous*	Machine	
Location 8	13:46	(0) / 1 / 2 / 3 / 4		*Intermittent / Continuous*		

Remark

	EPD Representative	Employer Representative	Independent Odour Patrol Team	Independent Odour Patrol Team	OSCAR Bioenergy JV
Name	TESS CHAN				Sarah HO
Signature		NA	NA	NA	Sarah
Date	13 MAR 2019				13/3/2019

Example of Odour Characteristics	Example of Possible Source of Odour
Biogas / Compost / sewage /rotten-egg smell/ decayed vegetables/ Diesel / ammoniacal/ dischargeable odour/ putrefaction/ sharp/ pungent/ fish/ irritating/ fruit/ vinegar	*PRVs of Gas Holder / Sediment/ Water / SSOW Trucks Doors Opened / Stack emission / Sewage / food waste/ Pretreatment / Machine Operation / Material / others /*

Organic Resources Recovery Centre (Phase 1)
Odour Patrol Record Log Sheet

OSCAR BIOENERGY

Date	15 March 2019
Type of Patrol	Weekly Patrol / ~~Monthly Independent Patrol~~ /
Weather Condition	Sunny / Cloudy / Windy / Humid / Foggy /
Average Temperature (°C)	22.8
Average Relative Humidity (%)	97%

Monitoring Location	Time	Odour Intensity	Odour Characteristics	Duration	Possible Source of Odour	Remark
Location 1	10:59	(0) / 1 / 2 / 3 / 4	—	~~Intermittent / Continuous~~		
Location 2	11:02	0 / (1) / 2 / 3 / 4	Biogas smell/plastic	Intermittent / Continuous	Biogas Hold PRV	—
Location 3	11:03	0 / (1) / 2 / 3 / 4	Biogas smell	Intermittent / Continuous	Vehicular Emission	—
Location 4	11:05	(0) / 1 / 2 / 3 / 4	—	Intermittent / Continuous		
Location 5	11:06	(0) / 1 / 2 / 3 / 4	—	Intermittent / Continuous		
Location 6	11:09	(0) / 1 / 2 / 3 / 4	—	Intermittent / Continuous		
Location 7	11:11	(0) / 1 / 2 / 3 / 4	—	Intermittent / Continuous		
Location 8	11:13	(0) / 1 / 2 / 3 / 4	—	Intermittent / Continuous		

Remark

	EPD Representative	Employer Representative	Independent Odour Patrol Team	Independent Odour Patrol Team	OSCAR Bioenergy JV
Name	TEE CHAI				Patience CHAN
Signature					
Date	15 MAR 2019				15/3/2019

Example of Odour Characteristics	Example of Possible Source of Odour
Biogas / Compost / sewage /rotten-egg smell/ decayed vegetables/ Diesel / ammoniacal/ dischargeable odour/ putrefaction/ sharp/ pungent/ fish/ irritating/ fruit/ vinegar	*PRVs of Gas Holder / Sediment/ Water / SSOW Trucks Doors Opened / Stack emission / Sewage / food waste/ Pretreatment / Machine Operation / Material / others /*

Organic Resources Recovery Centre (Phase 1)
Odour Patrol Record Log Sheet

OSCAR BIOENERGY

Date	18 Mar 2019
Type of Patrol	Weekly Patrol / ~~Monthly Independent Patrol~~ /
Weather Condition	(Sunny) / Cloudy / Windy / Humid / Foggy /
Average Temperature (°C)	26°C
Average Relative Humidity (%)	65%

Monitoring Location	Time	Odour Intensity	Odour Characteristics	Duration	Possible Source of Odour	Remark
Location 1	14:14	(0) / 1 / 2 / 3 / 4		*Intermittent / Continuous*		
Location 2	14:15	0 / (1) / 2 / 3 / 4	Plastic Smell	(Intermittent) / Continuous	PRV of Gas Holder	
Location 3	14:16	(0) / 1 / 2 / 3 / 4		*Intermittent / Continuous*		
Location 4	14:19	(0) / 1 / 2 / 3 / 4		*Intermittent / Continuous*		
Location 5	14:21	(0) / 1 / 2 / 3 / 4		*Intermittent / Continuous*		
Location 6	14:23	0 / (1) / 2 / 3 / 4	Soil Smell	~~Intermittent~~ / Continuous	Landscape works nearby at B2/B1	
Location 7	14:26	(0) / 1 / 2 / 3 / 4		*Intermittent / Continuous*		
Location 8	14:27	(0) / 1 / 2 / 3 / 4		*Intermittent / Continuous*		

Remark

	EPD Representative	Employer Representative	Independent Odour Patrol Team	Independent Odour Patrol Team	OSCAR Bioenergy JV
Name	David Choi				Terence CHAN
Signature					
Date	18/3/2019				18/3/2019

Example of Odour Characteristics	Example of Possible Source of Odour
Biogas / Compost / sewage /rotten-egg smell/ decayed vegetables/ Diesel / ammoniacal/ dischargeable odour/ putrefaction/ sharp/ pungent/ fish/ irritating/ fruit/ vinegar	*PRVs of Gas Holder / Sediment/ Water / SSOW Trucks Doors Opened / Stack emission / Sewage / food waste/ Pretreatment / Machine Operation / Material / others /*

Organic Resources Recovery Centre (Phase 1)
Odour Patrol Record Log Sheet

OSCAR BIOENERGY

Date	20 Mar 2019
Type of Patrol	Weekly Patrol / ~~Monthly Independent Patrol /~~
Weather Condition	Sunny / (Cloudy) / Windy / Humid / Foggy /
Average Temperature (°C)	25°C
Average Relative Humidity (%)	80%

Monitoring Location	Time	Odour Intensity	Odour Characteristics	Duration	Possible Source of Odour	Remark
Location 1	11:05	(0) / 1 / 2 / 3 / 4		*Intermittent / Continuous*		
Location 2	11:07	0 / (1) / 2 / 3 / 4	Plastic smell	*Intermittent / Continuous*	PRV of Gas Holder	-
Location 3	11:08	(0) / 1 / 2 / 3 / 4		*Intermittent / Continuous*		
Location 4	11:10	(0) / 1 / 2 / 3 / 4		*Intermittent / Continuous*		
Location 5	11:12	(0) / 1 / 2 / 3 / 4		*Intermittent / Continuous*		
Location 6	11:14	(0) / 1 / 2 / 3 / 4		*Intermittent / Continuous*		
Location 7	11:16	(0) / 1 / 2 / 3 / 4		*Intermittent / Continuous*		
Location 8	11:17	(0) / 1 / 2 / 3 / 4		*Intermittent / Continuous*		

Remark

	EPD Representative	Employer Representative	Independent Odour Patrol Team	Independent Odour Patrol Team	OSCAR Bioenergy JV
Name	Daniel Choi				Terence CHAN
Signature					
Date	20/3/2019				20/3/2019

Example of Odour Characteristics	Example of Possible Source of Odour
Biogas / Compost / sewage /rotten-egg smell/ decayed vegetables/ Diesel / ammoniacal/ dischargeable odour/ putrefaction/ sharp/ pungent/ fish/ irritating/ fruit/ vinegar	*PRVs of Gas Holder / Sediment/ Water / SSOW Trucks Doors Opened / Stack emission / Sewage / food waste/ Pretreatment / Machine Operation / Material / others /*

Organic Resources Recovery Centre (Phase 1)
Odour Patrol Record Log Sheet

OSCAR BIOENERGY

Date	22 Mar 2019
Type of Patrol	Weekly Patrol / ~~Monthly Independent Patrol~~ /
Weather Condition	Sunny / (Cloudy) / Windy / Humid / Foggy /
Average Temperature (°C)	27°C
Average Relative Humidity (%)	85%

Monitoring Location	Time	Odour Intensity	Odour Characteristics	Duration	Possible Source of Odour	Remark
Location 1	1:04	(0) / 1 / 2 / 3 / 4		Intermittent / Continuous		
Location 2	1:06	0 / (1) / 2 / 3 / 4	Plastic Smell	(Intermittent) / Continuous	PSV of Gas Holder	
Location 3	1:07	0 / (1) / 2 / 3 / 4	H_2S smell	(Intermittent) / Continuous	desulphur Analyser	
Location 4	1:10	(0) / 1 / 2 / 3 / 4		Intermittent / Continuous		
Location 5	1:12	0 / (1) / 2 / 3 / 4	Glass smell	(Intermittent) / Continuous	Landscape	
Location 6	1:16	(0) / 1 / 2 / 3 / 4		Intermittent / Continuous		
Location 7	1:17	0 / (1) / 2 / 3 / 4	Rubbish Smell	(Intermittent) / Continuous	Retreatment /	
Location 8	1:19	0 / (1) / 2 / 3 / 4	Rubbish smell	(Intermittent) / Continuous	unknown	

Remark

	EPD Representative	Employer Representative	Independent Odour Patrol Team	Independent Odour Patrol Team	OSCAR Bioenergy JV
Name	FIONA LAM				Terence CHAN
Signature	Fiona				
Date	22/3/2019				22/3/2019

Example of Odour Characteristics	Example of Possible Source of Odour
Biogas / Compost / sewage /rotten-egg smell/ decayed vegetables/ Diesel / ammoniacal/ dischargeable odour/ putrefaction/ sharp/ pungent/ fish/ irritating/ fruit/ vinegar	*PRVs of Gas Holder / Sediment/ Water / SSOW Trucks Doors Opened / Stack emission / Sewage / food waste/ Pretreatment / Machine Operation / Material / others /*

Organic Resources Recovery Centre (Phase 1)
Odour Patrol Record Log Sheet

OSCAR BIOENERGY

Date	25 / 3 / 2019
Type of Patrol	(Weekly Patrol) / Monthly Independent Patrol /
Weather Condition	Sunny / (Cloudy) / Windy / Humid / Foggy /
Average Temperature (°C)	23.3
Average Relative Humidity (%)	70

Monitoring Location	Time	Odour Intensity	Odour Characteristics	Duration	Possible Source of Odour	Remark
Location 1	11:06	0 / (1) / 2 / 3 / 4	Grass Smell	(Intermittent) / Continuous	Grass	
Location 2	11:08	0 / (1) / 2 / 3 / 4	Biogas	(Intermittent) / Continuous	Biogas Holder	
Location 3	11:10	0 / (1) / 2 / 3 / 4	H_2S	(Intermittent) / Continuous	Desulphurization Unit	
Location 4	11:13	(0) / 1 / 2 / 3 / 4		Intermittent / Continuous		
Location 5	11:16	(0) / 1 / 2 / 3 / 4		Intermittent / Continuous		
Location 6	11:18	0 / (1) / 2 / 3 / 4	Compost	(Intermittent) / Continuous	Composting Hall	
Location 7	11:22	0 / (1) / 2 / 3 / 4	Generator	Intermittent / Continuous	Electric Generator	
Location 8	11:25	(0) / 1 / 2 / 3 / 4		Intermittent / Continuous		

Remark

	EPD Representative	Employer Representative	Independent Odour Patrol Team	Independent Odour Patrol Team	OSCAR Bioenergy JV
Name	Fiona LAM				Sarah HO
Signature	Fiona	NA	NA	NA	Sarah
Date	25/3/2019				25 / 3 / 2019

Example of Odour Characteristics	Example of Possible Source of Odour
Biogas / Compost / sewage /rotten-egg smell/ decayed vegetables/ Diesel / ammoniacal/ dischargeable odour/ putrefaction/ sharp/ pungent/ fish/ irritating/ fruit/ vinegar	*PRVs of Gas Holder / Sediment/ Water / SSOW Trucks Doors Opened / Stack emission / Sewage / food waste/ Pretreatment / Machine Operation / Material / others /*

Organic Resources Recovery Centre (Phase 1)
Odour Patrol Record Log Sheet

OSCAR BIOENERGY

Date	27 / 3 / 2019
Type of Patrol	(Weekly Patrol) / Monthly Independent Patrol /
Weather Condition	Sunny / (Cloudy) / Windy / Humid / Foggy /
Average Temperature (°C)	24.4
Average Relative Humidity (%)	69

Monitoring Location	Time	Odour Intensity	Odour Characteristics	Duration	Possible Source of Odour	Remark
Location 1	10:05	(0) / 1 / 2 / 3 / 4		*Intermittent / Continuous*		
Location 2	10:07	0 / (1) / 2 / 3 / 4	Biogas	*Intermittent / (Continuous)*	Biogas Holder	
Location 3	10:08	0 / (1) / 2 / 3 / 4	Biogas	*(Intermittent) / Continuous*	Biogas Holder	
Location 4	10:11	(0) / 1 / 2 / 3 / 4		*Intermittent / Continuous*		
Location 5	10:14	(0) / 1 / 2 / 3 / 4		*Intermittent / Continuous*		
Location 6	10:16	(0) / 1 / 2 / 3 / 4		*Intermittent / Continuous*		
Location 7	10:18	(0) / 1 / 2 / 3 / 4		*Intermittent / Continuous*		
Location 8	10:19	(0) / 1 / 2 / 3 / 4		*Intermittent / Continuous*		

Remark

	EPD Representative	Employer Representative	Independent Odour Patrol Team	Independent Odour Patrol Team	OSCAR Bioenergy JV
Name	FIONA LAM				Sarah HO
Signature	Fiona	NA	NA	NA	Sarah.
Date	27/3/2019				27/3/2019

Example of Odour Characteristics	Example of Possible Source of Odour
Biogas / Compost / sewage /rotten-egg smell/ decayed vegetables/ Diesel / ammoniacal/ dischargeable odour/ putrefaction/ sharp/ pungent/ fish/ irritating/ fruit/ vinegar	*PRVs of Gas Holder / Sediment/ Water / SSOW Trucks Doors Opened / Stack emission / Sewage / food waste/ Pretreatment / Machine Operation / Material / others /*

Organic Resources Recovery Centre (Phase 1)
Odour Patrol Record Log Sheet

OSCAR BIOENERGY

Date	29 / 3 / 2019
Type of Patrol	(Weekly Patrol) / Monthly Independent Patrol /
Weather Condition	Sunny / (Cloudy) / Windy / Humid / Foggy /
Average Temperature (℃)	25.8
Average Relative Humidity (%)	80

Monitoring Location	Time	Odour Intensity	Odour Characteristics	Duration	Possible Source of Odour	Remark
Location 1	9:20	(0) / 1 / 2 / 3 / 4		Intermittent / Continuous		
Location 2	9:22	0 / (1) / 2 / 3 / 4	Biogas	Intermittent / (Continuous)	Biogas Holder	
Location 3	9:23	0 / (1) / 2 / 3 / 4	Biogas	(Intermittent) / Continuous	Biogas Holder	
Location 4	9:26	(0) / 1 / 2 / 3 / 4		Intermittent / Continuous		
Location 5	9:28	0 / (1) / 2 / 3 / 4	Grass	(Intermittent) / Continuous	Grass	
Location 6	9:30	(0) / 1 / 2 / 3 / 4		Intermittent / Continuous		
Location 7	9:33	0 / (1) / 2 / 3 / 4	Rubbish	(Intermittent) / Continuous	Inert Truck	
Location 8	9:35	(0) / 1 / 2 / 3 / 4		Intermittent / Continuous		

Remark

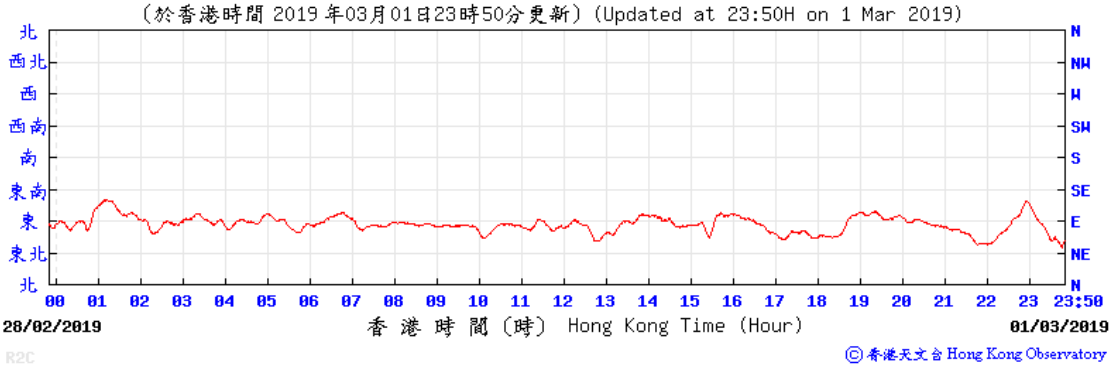
	EPD Representative	Employer Representative	Independent Odour Patrol Team	Independent Odour Patrol Team	OSCAR Bioenergy JV
Name	FIONA LAM				Sarah HO
Signature	FionA	NA	NA	NA	Sarah
Date	29/3/2019				29/3/2019

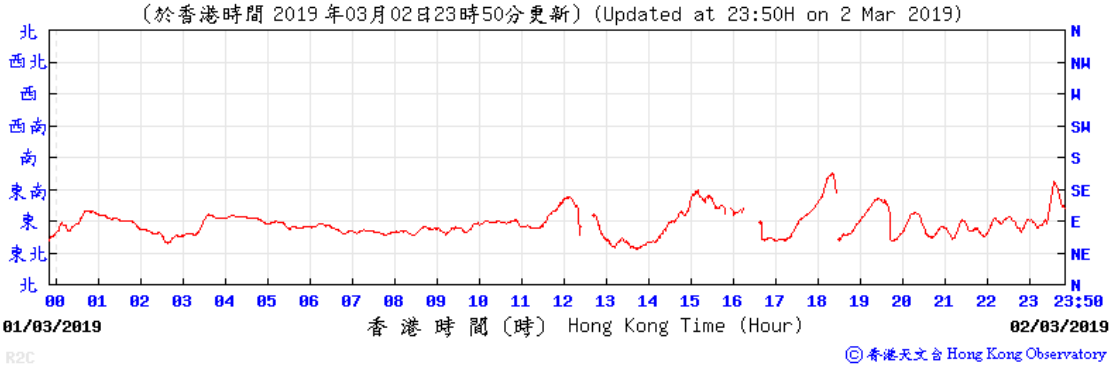
Example of Odour Characteristics	Example of Possible Source of Odour
Biogas / Compost / sewage /rotten-egg smell/ decayed vegetables/ Diesel / ammoniacal/ dischargeable odour/ putrefaction/ sharp/ pungent/ fish/ irritating/ fruit/ vinegar	*PRVs of Gas Holder / Sediment/ Water / SSOW Trucks Doors Opened / Stack emission / Sewage / food waste/ Pretreatment / Machine Operation / Material / others /*

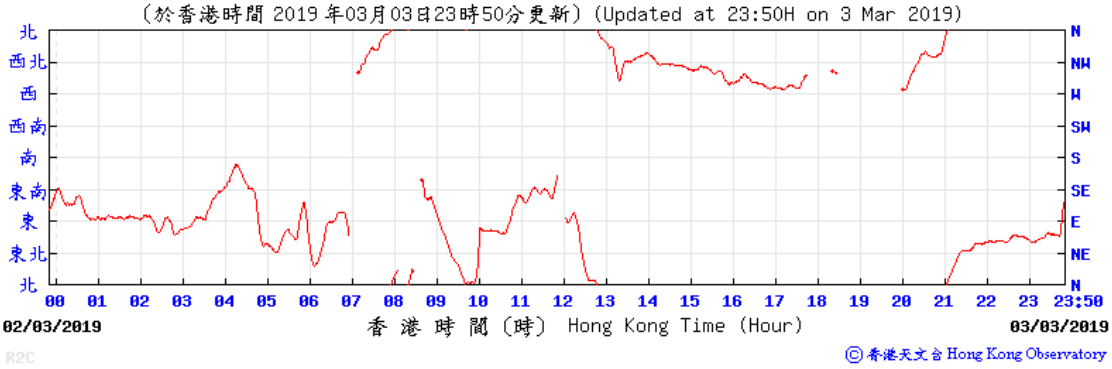
Annex H2

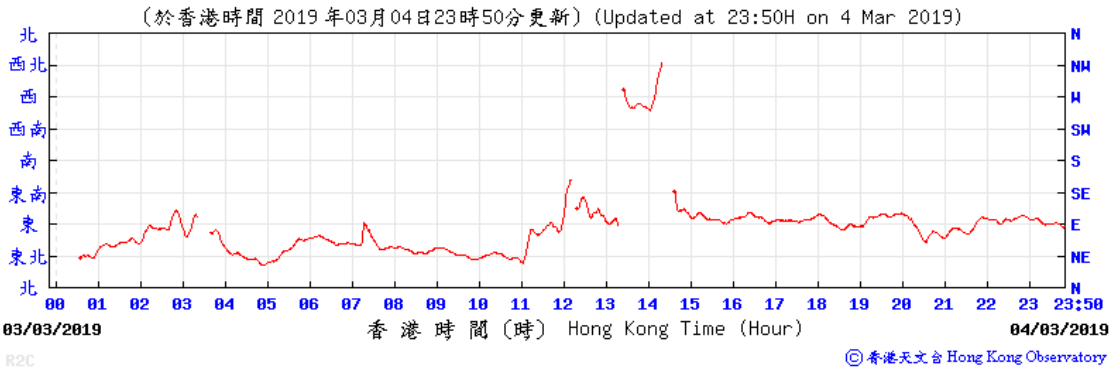
Local Wind Direction and Wind Speed

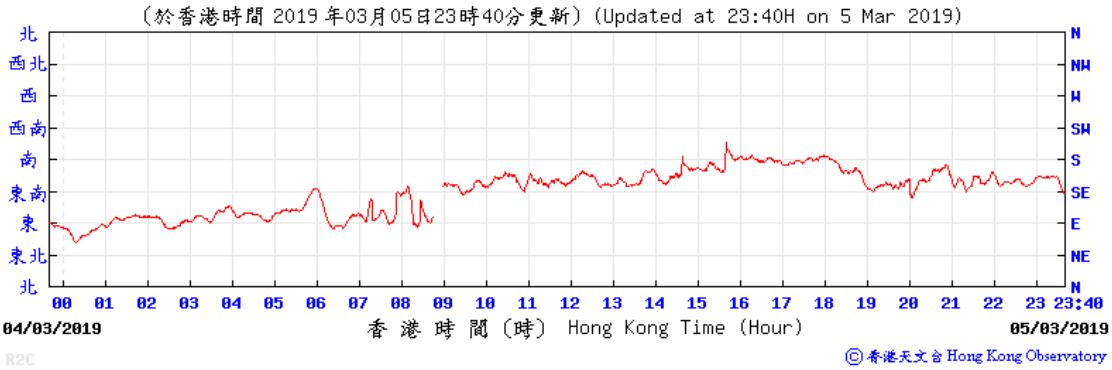
Wind Direction







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北 西北 西 西南 南 東南 東 東北 北
N NW W SW S SE E NE N
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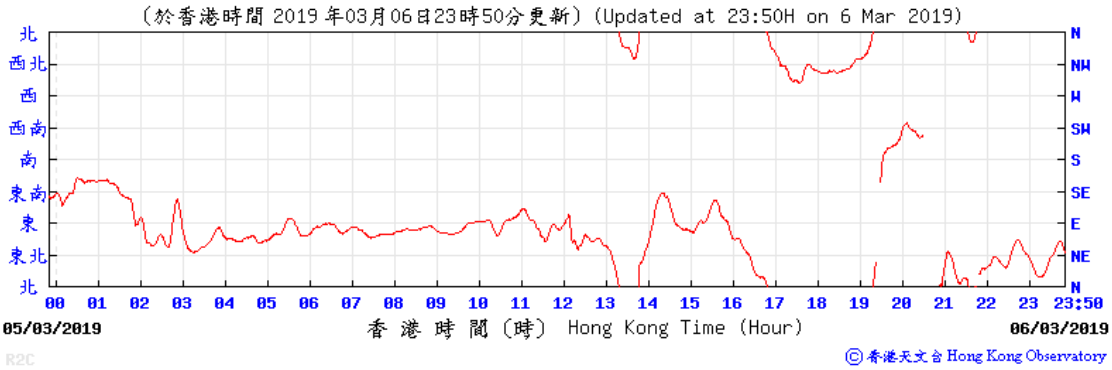
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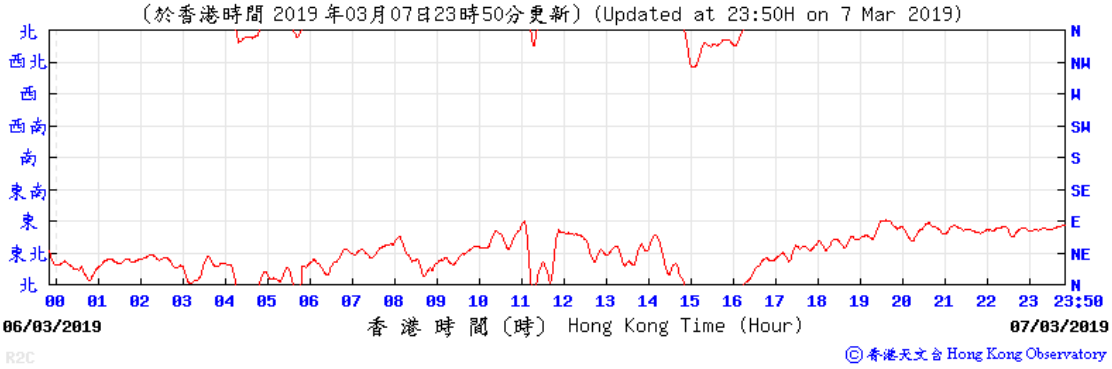
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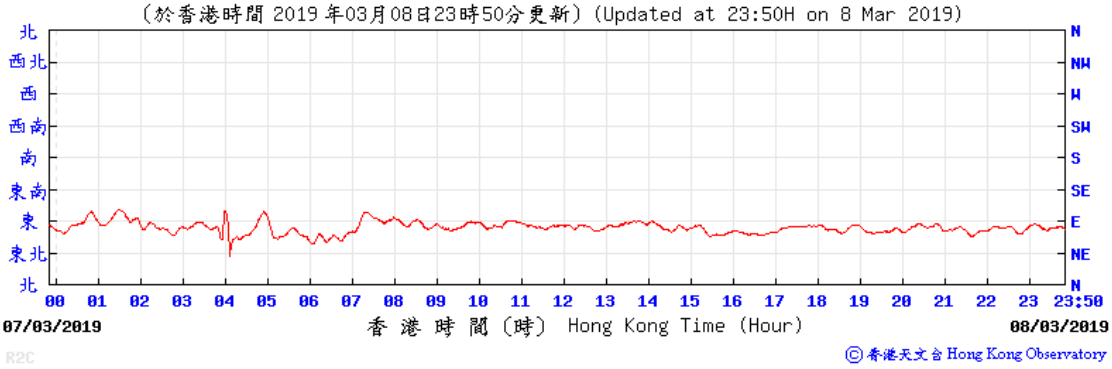
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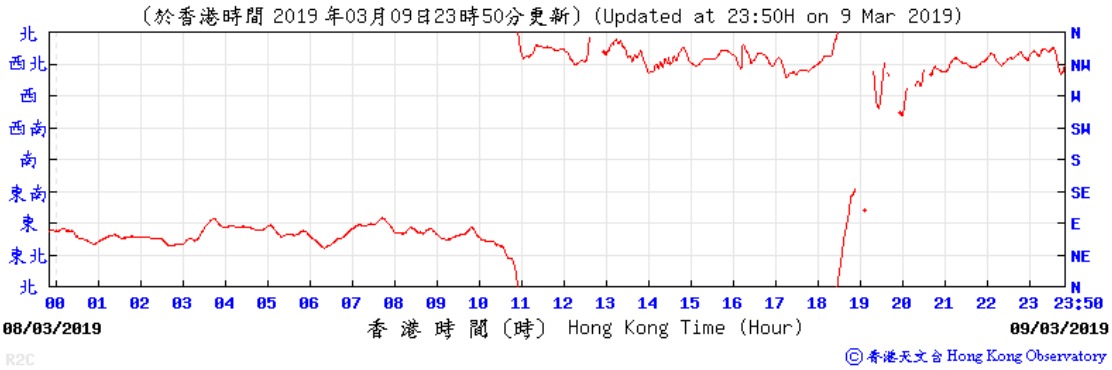
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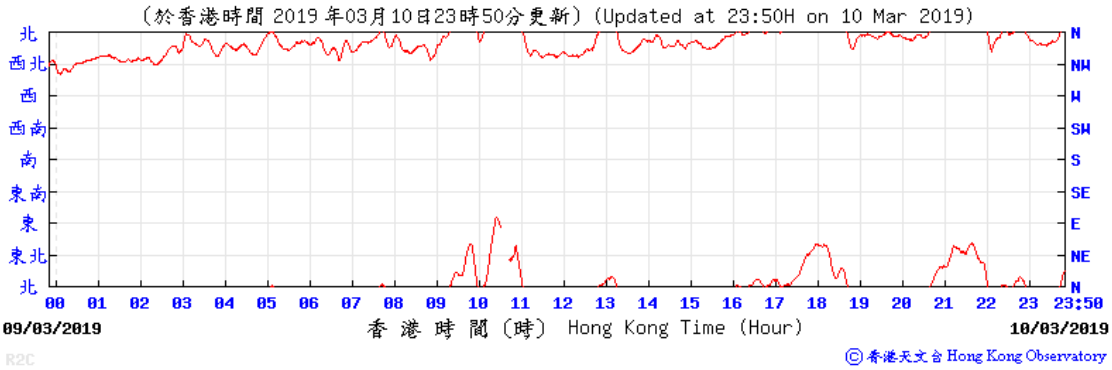
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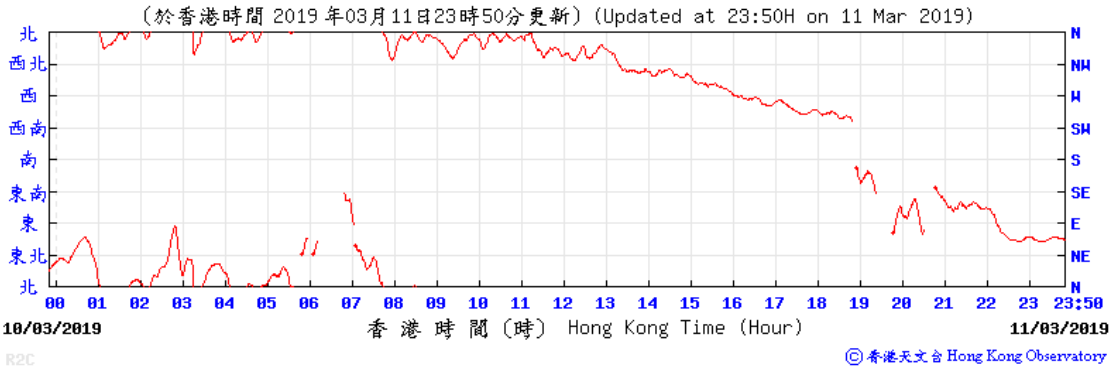
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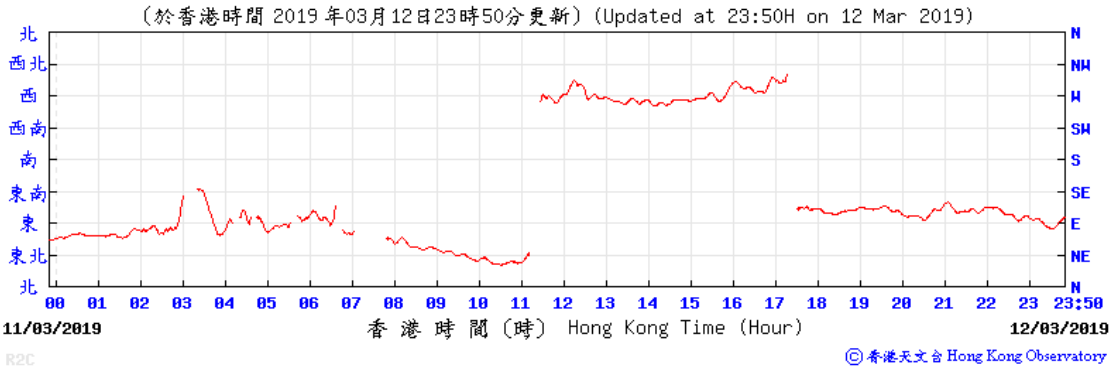
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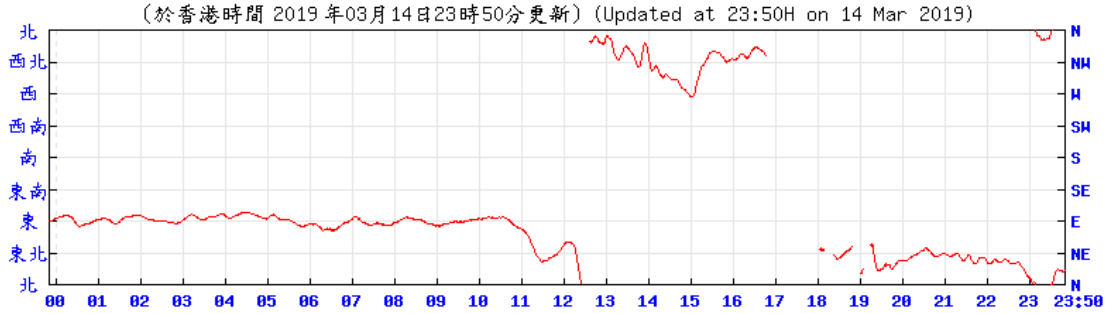

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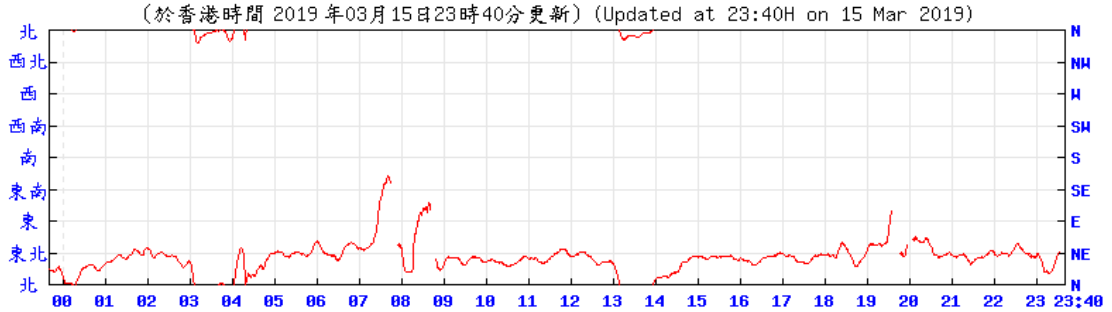

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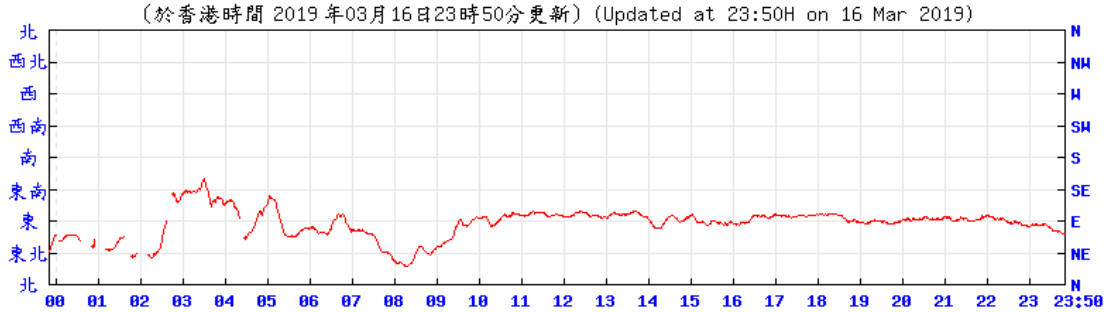

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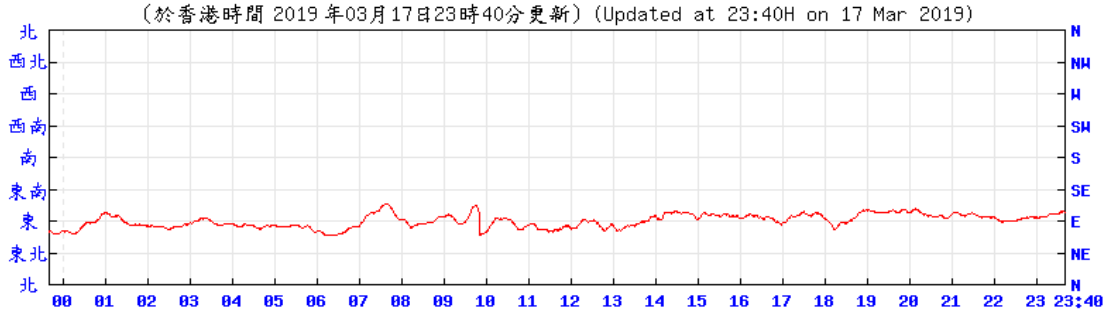

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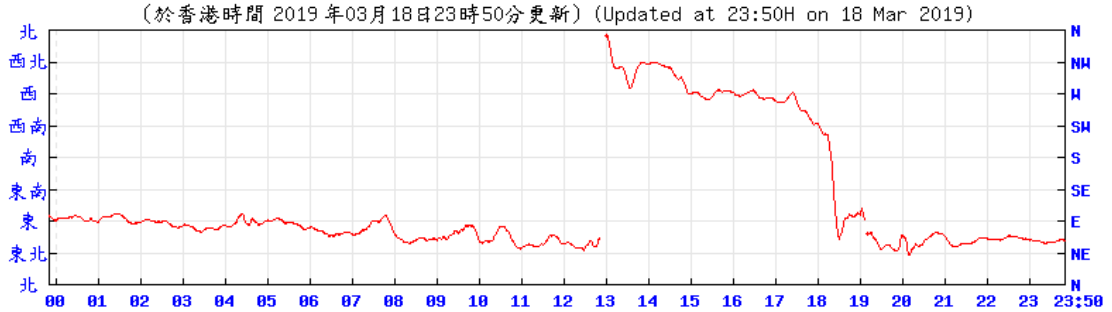

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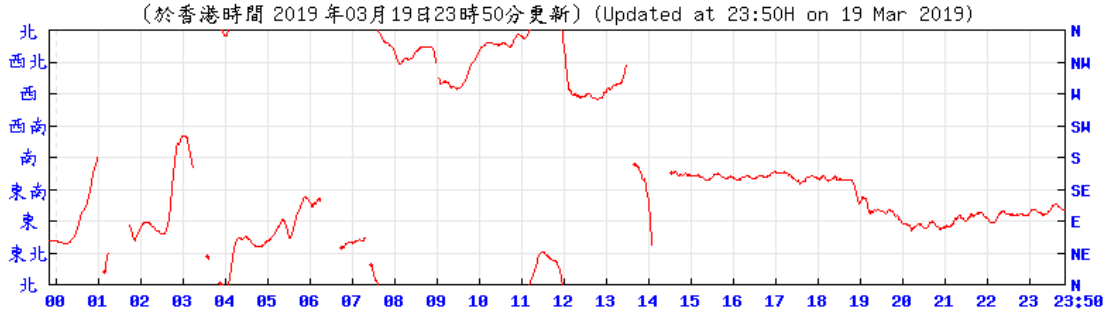

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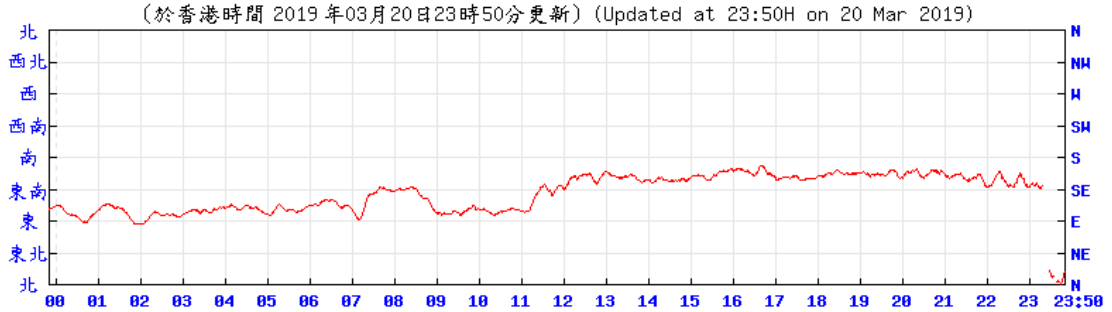

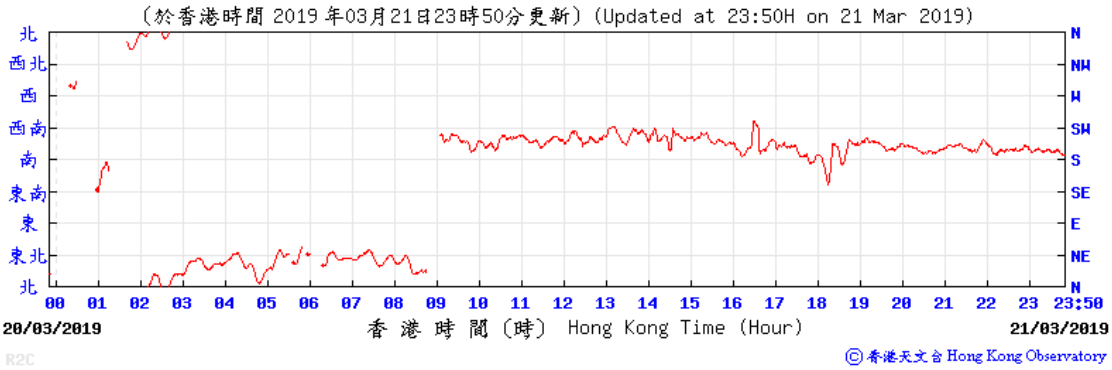
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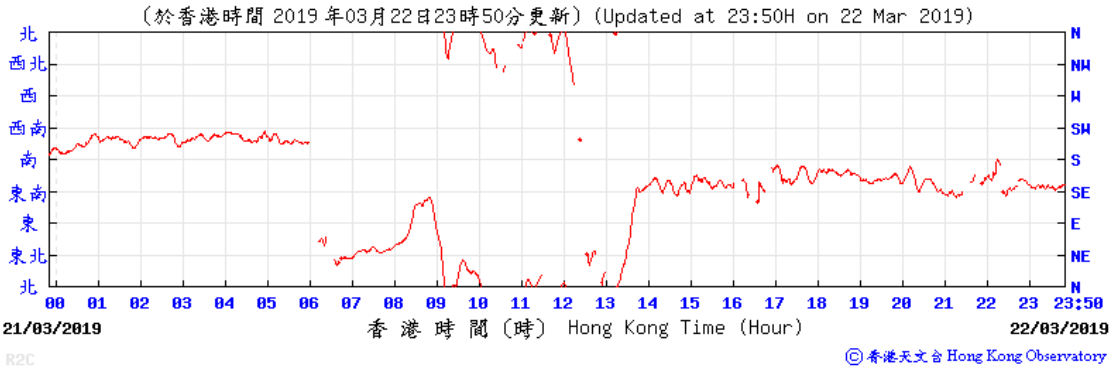
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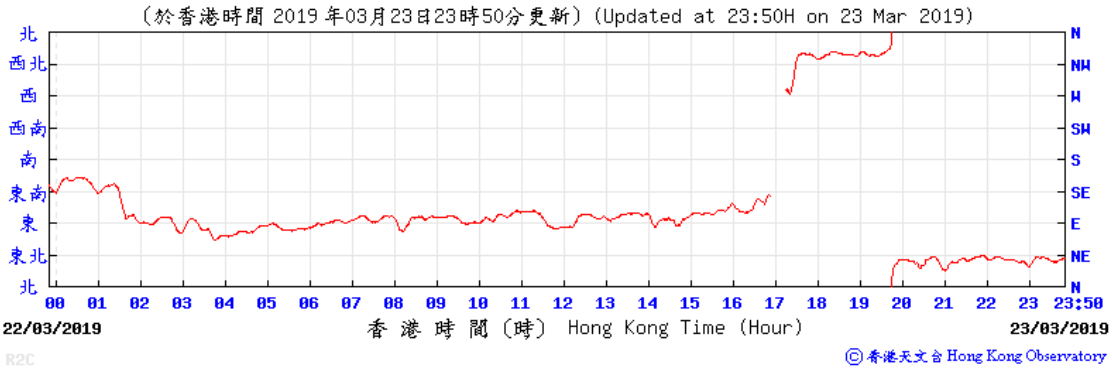
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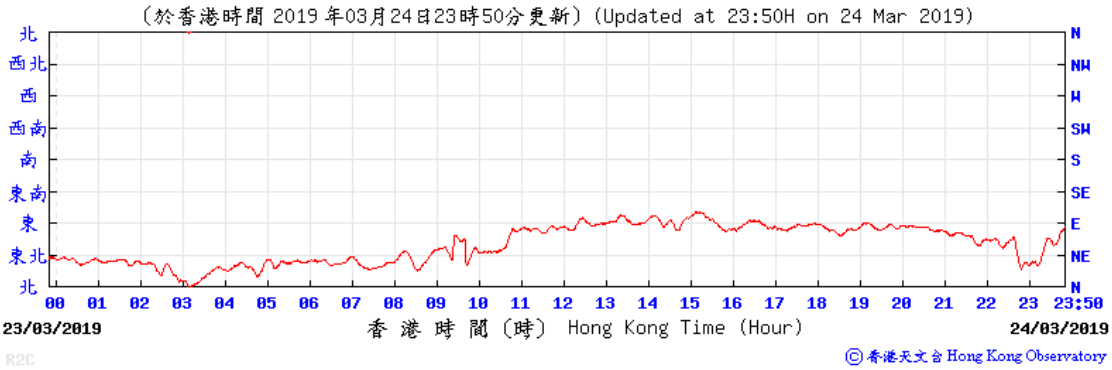
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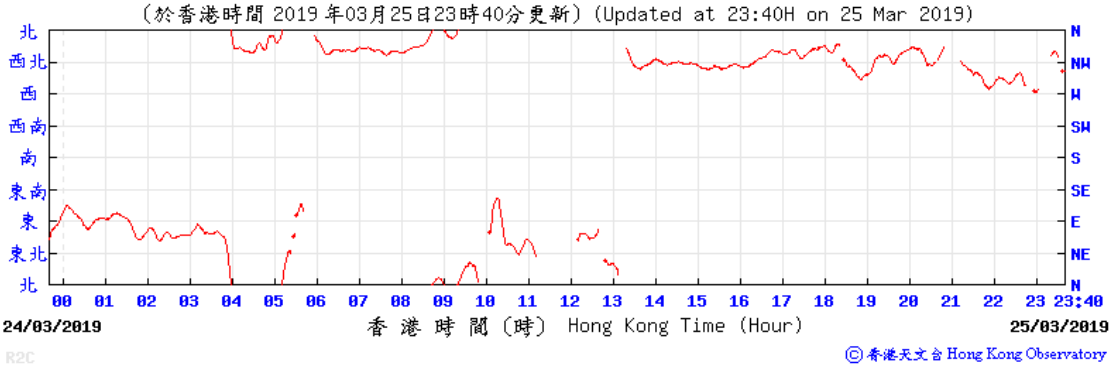

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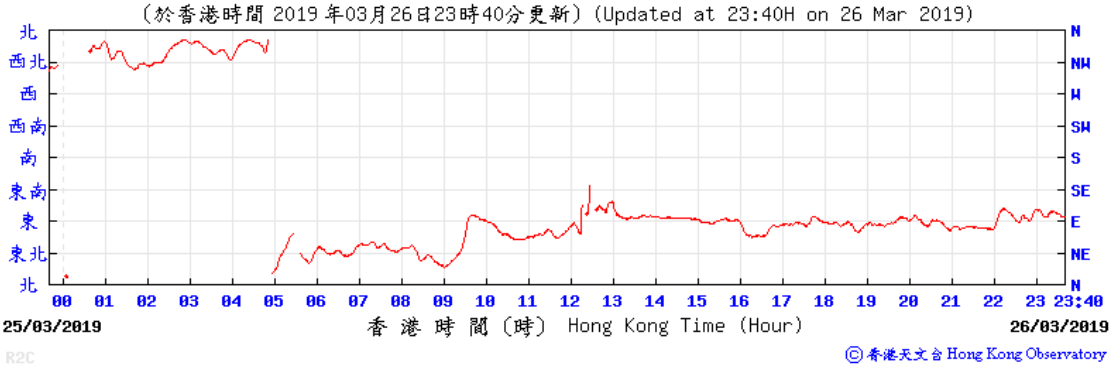

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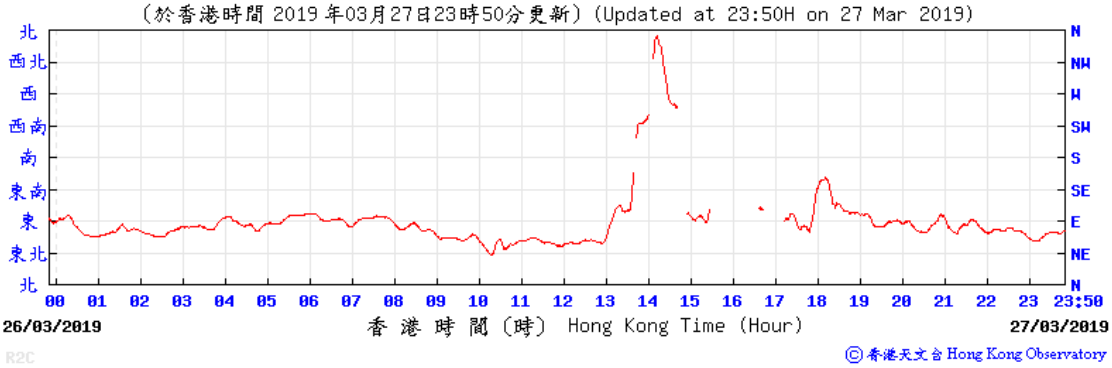

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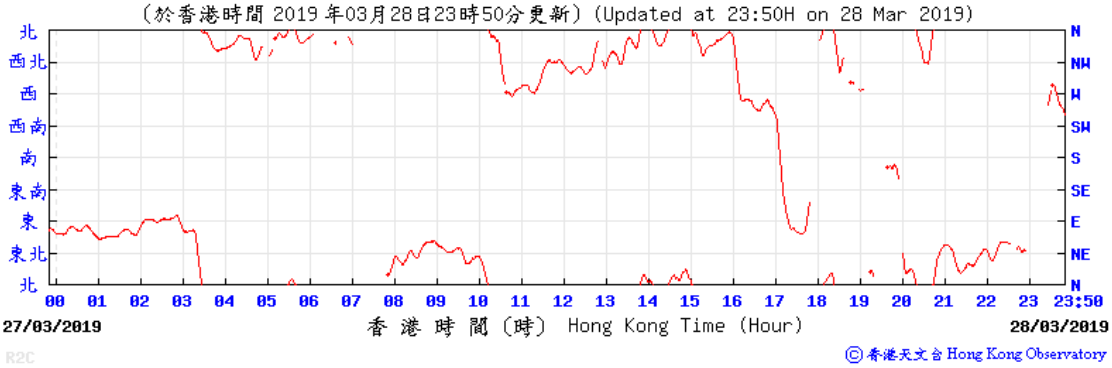

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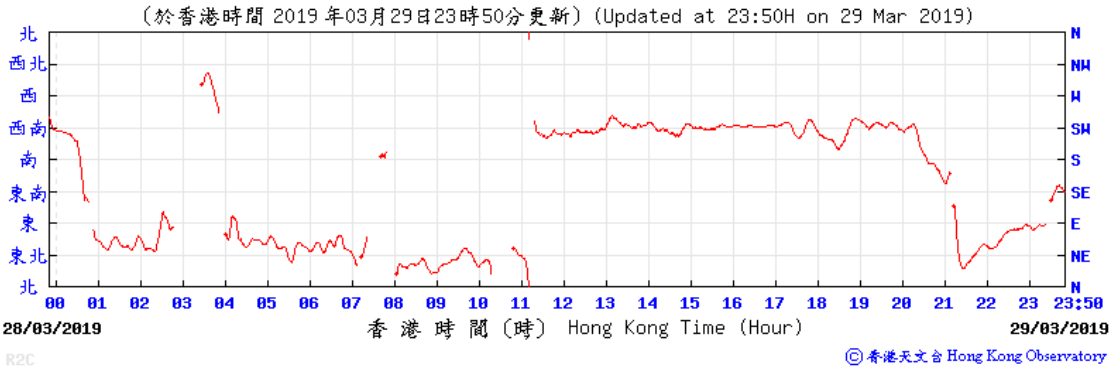
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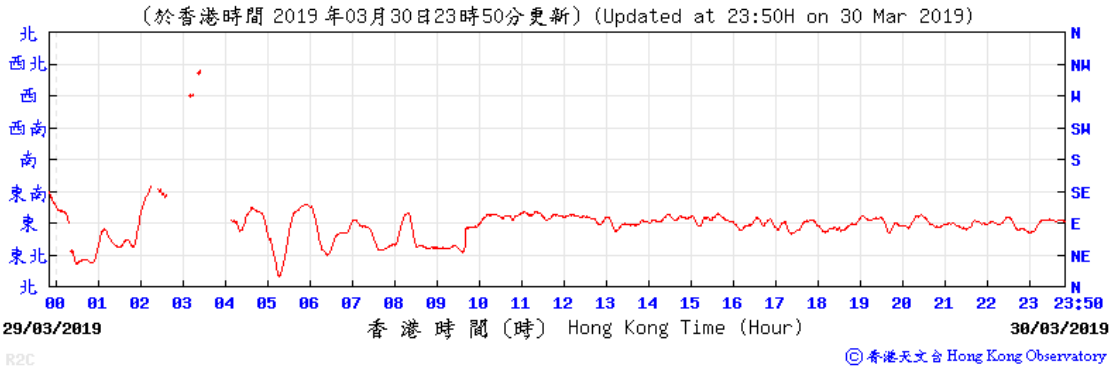
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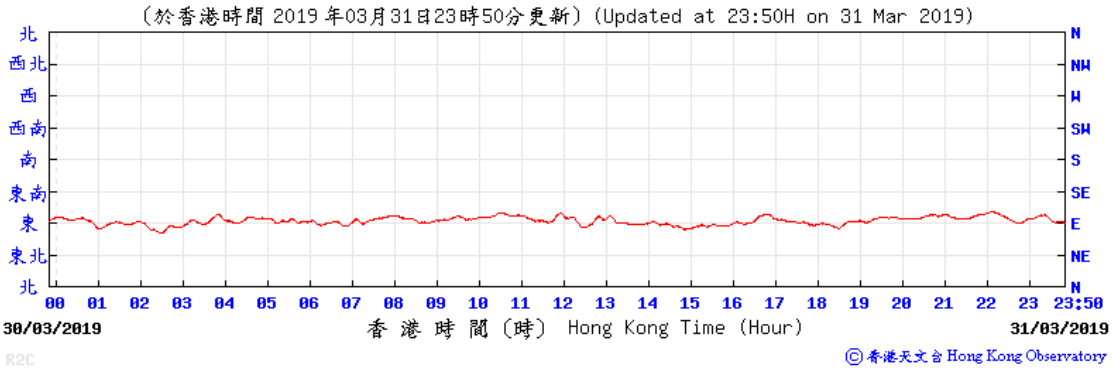
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香 港 時 間 (時) Hong Kong Time (Hour)
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Annex H3

Odour Sampling Result

ALS Technichem (HK) Pty Ltd
1/F, Chung Shun Knitting Centre
1-3 Wing Yip Street
Kwai Chung, N.T., Hong Kong
T +852 2610 1044 F +852 2610 2021

CERTIFICATE OF ANALYSIS

CLIENT:	Oscar Bioenergy Joint Venture	WORK ORDER:	HK1864017
CONTACT:	Mr Edwin Wong		
ADDRESS:	No. 5, Sham Fung Road, Siu Ho Wan, North Lantau Island, NT, Hong Kong	LABORATORY:	Hong Kong
		SUB-BATCH:	0
		DATE RECEIVED:	10 December 2018
		DATE OF ISSUE:	14 December 2018
PROJECT:	Odour Monitoring for the Organic Resources Recovery Centre Phase 1 in Siu Ho Wan	SAMPLE TYPE:	Air
SITE:	Organic Resources Recovery Centre Phase 1 (ORRC1)	NO OF SAMPLES:	3
PO:	---		

COMMENTS

Air sample(s) were collected by ALS Technichem (HK) staff on 10th December, 2018 at the Organic Resources Recovery Centre Phase 1 (ORRC1) in Siu Ho Wan for Odour Monitoring.

The sample(s) were analysed and reported on an as received basis.

NOTES

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.

Richard Fung
General Manager - Hong Kong

METHOD STATEMENT

A. Odour Concentration

1. Odour Sampling

Odour gas sample was collected by passive sampling technique. A Nalophan™ sampling bag was placed inside an air-tight sampler and then drawn to vacuum. Approximately 60 litre of gas sample was collected into the sampling bag for testing.

The odour sample was collected at the Organic Recovery Resources Centre Phase 1 (ORRC1) and sampling location was shown in Appendix A3.

2. Olfactometry Testing

Odour concentration was determined by a Forced-choice Dynamic Olfactometer in accordance with the European Standard Method (EN13725).

This European Standard specifies a method for the objective determination of the odour concentration of a gaseous sample using dynamic olfactometry with human assessors and the emission rate of odours emanating from point sources, area sources with outward flow and area sources without outward flow.

This European Standard is applicable to the measurement of odour concentration of pure substances, defined mixtures and undefined mixtures of gaseous odorants in air or nitrogen, using dynamic olfactometry with a panel of human assessors being the sensor.

The unit of measurement is the odour unit per cubic metre: OU_E/m^3. The odour concentration is measured by determining the dilution factor required to reach the detection threshold. The odour concentration at the detection threshold is by definition 1 OU_E/m^3. The odour concentration is then expressed in terms of multiples of the detection threshold. The range of measurement including pre-dilution prior to the olfactometry analysis is typically from 10^1 OU_E/m^3 to 10^7 OU_E/m^3.

Olfactometry Testing was performed by using the Scentroid™ SS600 Olfactometer. The testing was performed by at least five qualified panellists who have been selected through an n-butanol screening test.

All testing finished within 24 hours after sample receipt.

RESULT

1. Odour Concentration

Sample ID	Location	Sampling Date	Sampling Time	LOR (OU_E/Nm^3)	Odour Concentration (OU_E/Nm^3)	Characteristics of the odour detected of the gas sample	Volumetric Flow Rate (Nm^3/min)	Emission rate (OU_E/hr)
HK1864017-001	CAPC Unit (Bypass AC Filter)	10-Dec-18	11:36-11:41	11	828	Decayed orange with minor bleach smell	1267.4	63,000,000
HK1864017-002	CAPC Unit (Bypass AC Filter)	10-Dec-18	11:41-11:46	11	886	Decayed orange with minor bleach smell	1267.4	67,400,000
HK1864017-003	Field Blank	10-Dec-18	--	11	<11	--	--	--

Remark:
1. LOR denotes limit of reporting.
2. The collected sample volume of the gas bag is sufficient for olfactometry analysis.
3. Field Blank containing pure nitrogen gas was collected and filled by ALS staff.
4. The volumetric flow rate value for calculation of the emission rate was provided by the client.

APPENDIX 1

A1. SITE CONDITIONS AND OBSERVATION

Location	Date	Time	Ambient Temperature (°C)	Relative Humidity (%)	Ambient Pressure (hPa)	Wind Speed (m/s)	Wind Direction (Degree)	Direction from Source[1]	Duration of Odour	On-Site Observation		Weather Condition
										Odour Nature	Possible Source	
CAPC Unit	10-12-18	11:36 - 11:46	17.3	64.6	1019.4	0.7	320	NA	NA	No odour was smelled.	NA	Cloudy

Note:
1. It was assumed that the exhaust of the CAPC Unit was from the odour source.

APPENDIX 2

A2. EXTRACT OF METEOROLOGICAL OBSERVATIONS FROM THE HONG KONG AIRPORT OBSERVATORY STATION

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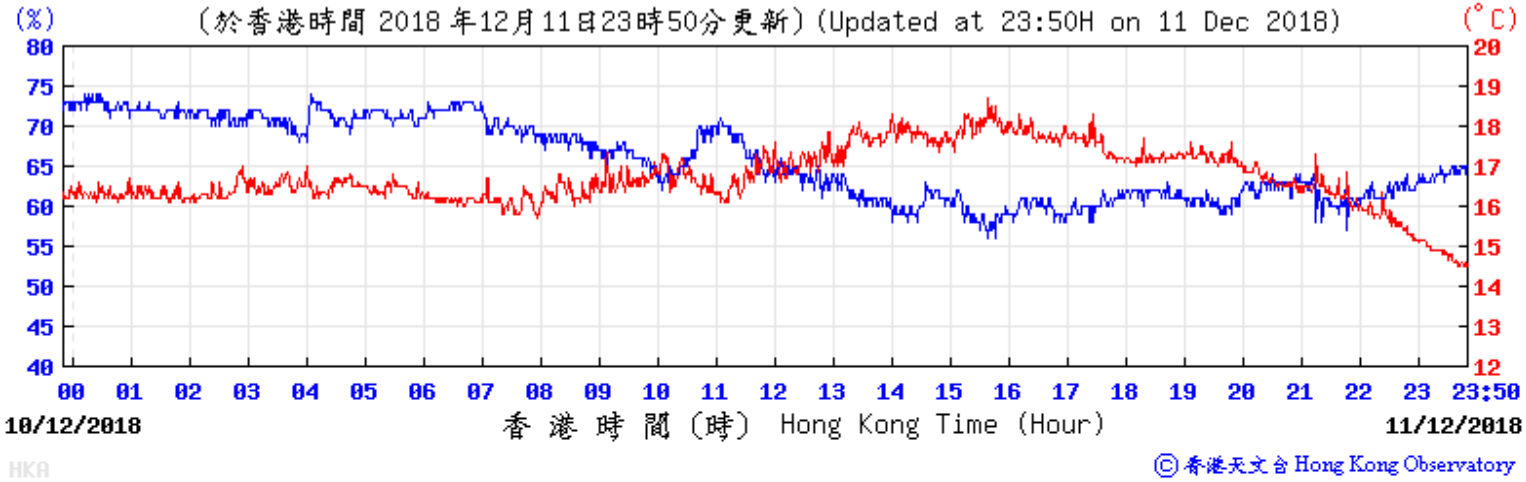

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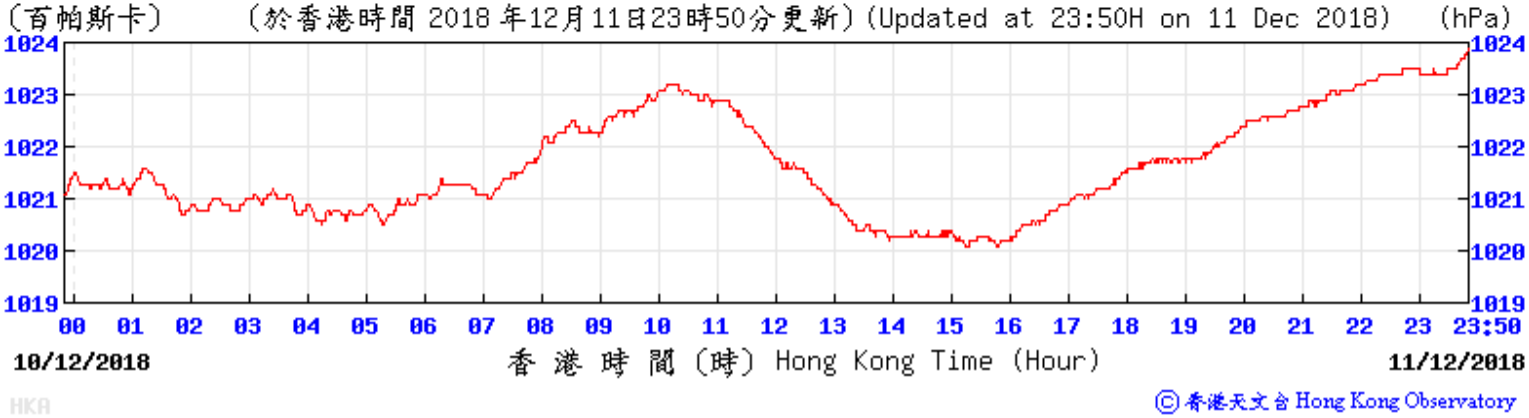

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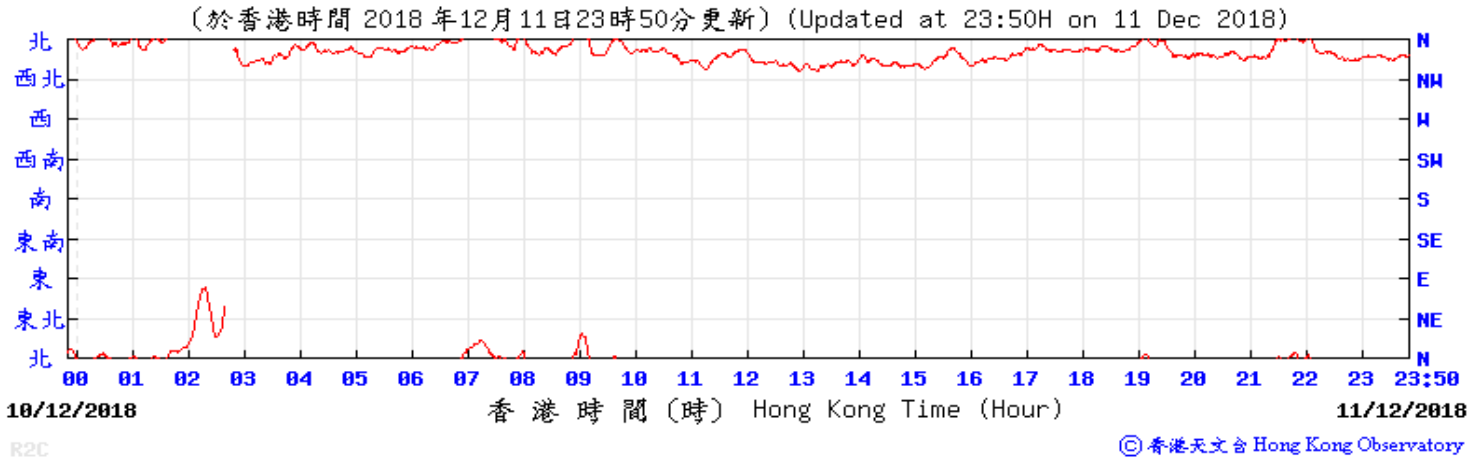

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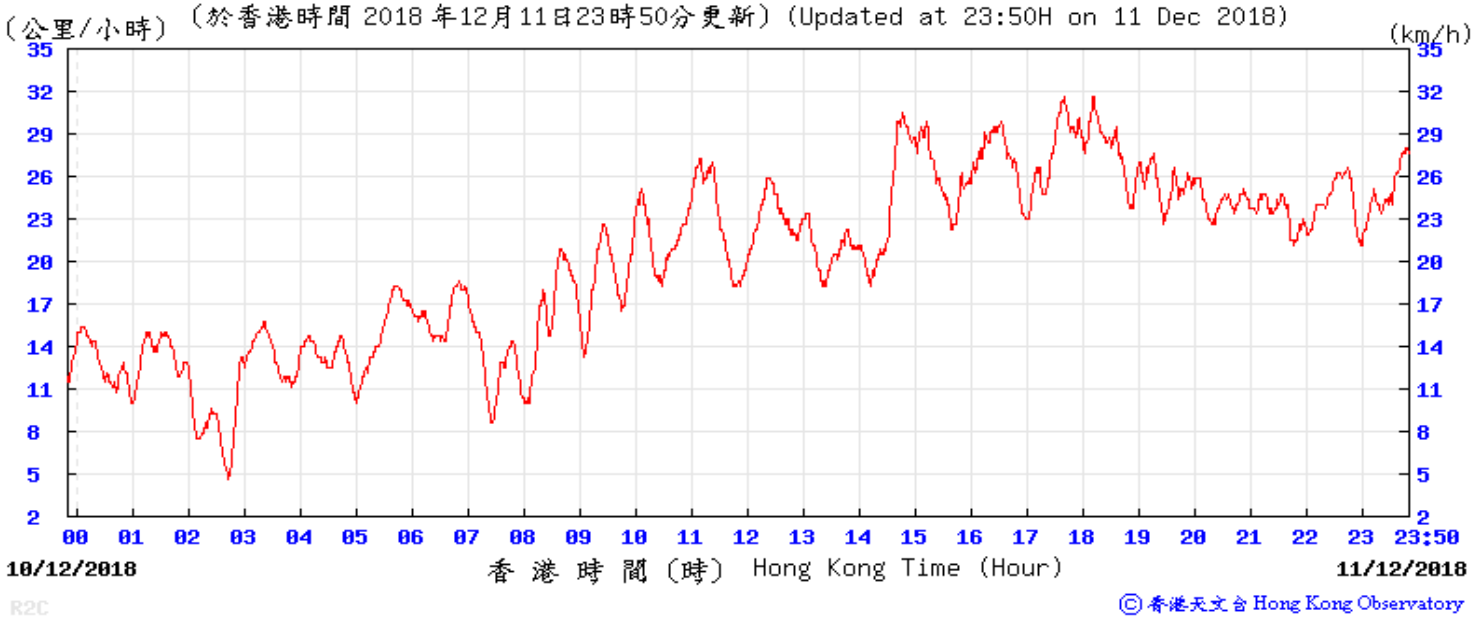


APPENDIX 3

A3. PHOTO OF THE SAMPLING LOCATION

ALS Technichem (HK) Pty Ltd
11/F, Chung Shun Knitting Centre
1-3 Wing Yip Street
Kwai Chung, N.T., Hong Kong
T +852 2610 1044 F +852 2610 2021

CERTIFICATE OF ANALYSIS

CLIENT:	Oscar Bioenergy Joint Venture	WORK ORDER:	HK1864595
CONTACT:	Mr Edwin Wong		
ADDRESS:	No. 5, Sham Fung Road, Siu Ho Wan, North Lantau Island, NT, Hong Kong	LABORATORY:	Hong Kong
		SUB-BATCH:	0
		DATE RECEIVED:	10 December 2018
		DATE OF ISSUE:	14 December 2018
PROJECT:	Odour Monitoring for the Organic Resources Recovery Centre Phase 1 in Siu Ho Wan	SAMPLE TYPE:	Air
SITE:	Organic Resources Recovery Centre Phase 1 (ORRC1)	NO OF SAMPLES:	3
PO:	---		

COMMENTS

Air sample(s) were collected by ALS Technichem (HK) staff on 10th December, 2018 at the Organic Resources Recovery Centre Phase 1 (ORRC1) in Siu Ho Wan for Odour Monitoring.

The sample(s) were analysed and reported on an as received basis.

NOTES

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.

Richard Fung
General Manager - Hong Kong

METHOD STATEMENT

A. Odour Concentration

1. Odour Sampling

Odour gas sample was collected by passive sampling technique. A Nalophan™ sampling bag was placed inside an air-tight sampler and then drawn to vacuum. Approximately 60 litre of gas sample was collected into the sampling bag for testing.

The odour sample was collected at the Organic Recovery Resources Centre Phase 1 (ORRC1) and sampling location was shown in Appendix A3.

2. Olfactometry Testing

Odour concentration was determined by a Forced-choice Dynamic Olfactometer in accordance with the European Standard Method (EN13725).

This European Standard specifies a method for the objective determination of the odour concentration of a gaseous sample using dynamic olfactometry with human assessors and the emission rate of odours emanating from point sources, area sources with outward flow and area sources without outward flow.

This European Standard is applicable to the measurement of odour concentration of pure substances, defined mixtures and undefined mixtures of gaseous odorants in air or nitrogen, using dynamic olfactometry with a panel of human assessors being the sensor.

The unit of measurement is the odour unit per cubic metre: OU_E/m^3. The odour concentration is measured by determining the dilution factor required to reach the detection threshold. The odour concentration at the detection threshold is by definition 1 OU_E/m^3. The odour concentration is then expressed in terms of multiples of the detection threshold. The range of measurement including pre-dilution prior to the olfactometry analysis is typically from 10^1 OU_E/m^3 to 10^7 OU_E/m^3.

Olfactometry Testing was performed by using the Scentroid™ SS600 Olfactometer. The testing was performed by at least five qualified panellists who have been selected through an n-butanol screening test.

All testing finished within 24 hours after sample receipt.

RESULT

1. Odour Concentration

Sample ID	Location	Sampling Date	Sampling Time	LOR (OU_E/Nm^3)	Odour Concentration (OU_E/Nm^3)	Characteristics of the odour detected of the gas sample	Volumetric Flow Rate (Nm^3/min)	Emission rate (OU_E/hr)
HK1864595-001	CAPC Unit (With AC Filter)	10-Dec-18	11:56 – 12:02	11	773	Decayed orange	1156.5	53,600,000
HK1864595-002	CAPC Unit (With AC Filter)	10-Dec-18	12:02 – 12:07	11	674	Decayed orange	1156.5	46,800,000
HK1864595-003	Field Blank	10-Dec-18	--	11	<11	--	--	--

Remark:
1. LOR denotes limit of reporting.
2. The collected sample volume of the gas bag is sufficient for olfactometry analysis.
3. Field Blank containing pure nitrogen gas was collected and filled by ALS staff.
4. The volumetric flow rate value for calculation of the emission rate was provided by the client.

APPENDIX 1

A1. SITE CONDITIONS AND OBSERVATION

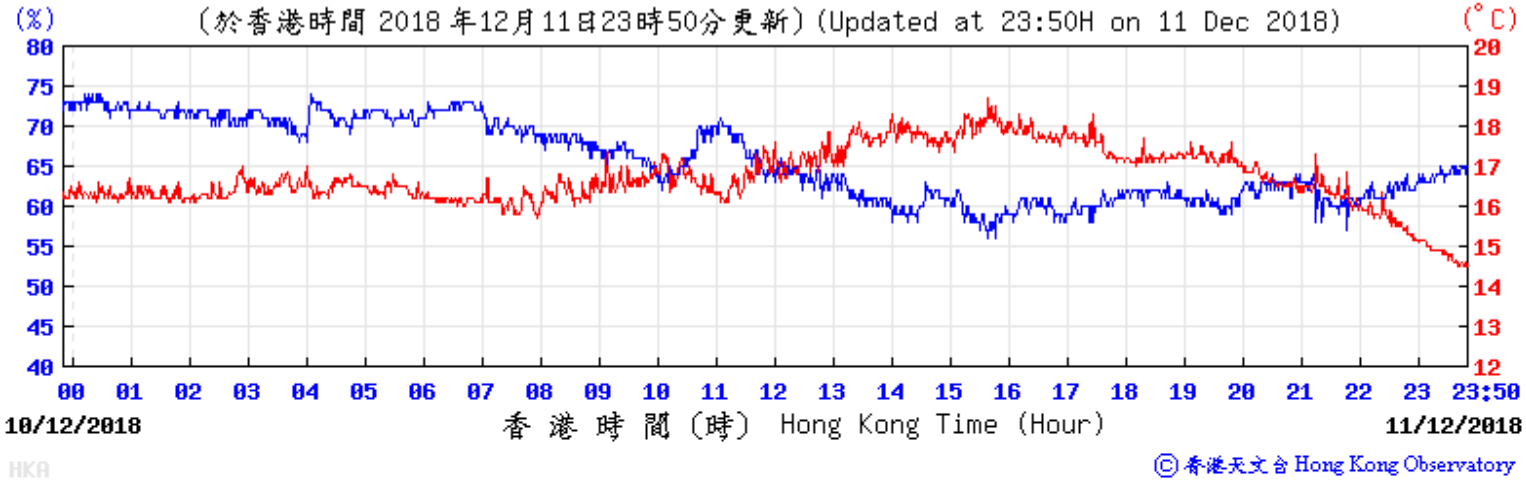
Location	Date	Time	Ambient Temperature (°C)	Relative Humidity (%)	Ambient Pressure (hPa)	Wind Speed (m/s)	Wind Direction (Degree)	Direction from Source[1]	Duration of Odour	On-Site Observation		Weather Condition
										Odour Nature	Possible Source	
CAPC Unit	10-12-18	11:56 - 12:07	17.8	64.1	1019.4	0.8	291	NA	NA	No odour was smelled.	NA	Cloudy

Note:
1. It was assumed that the exhaust of the CAPC Unit was from the odour source.

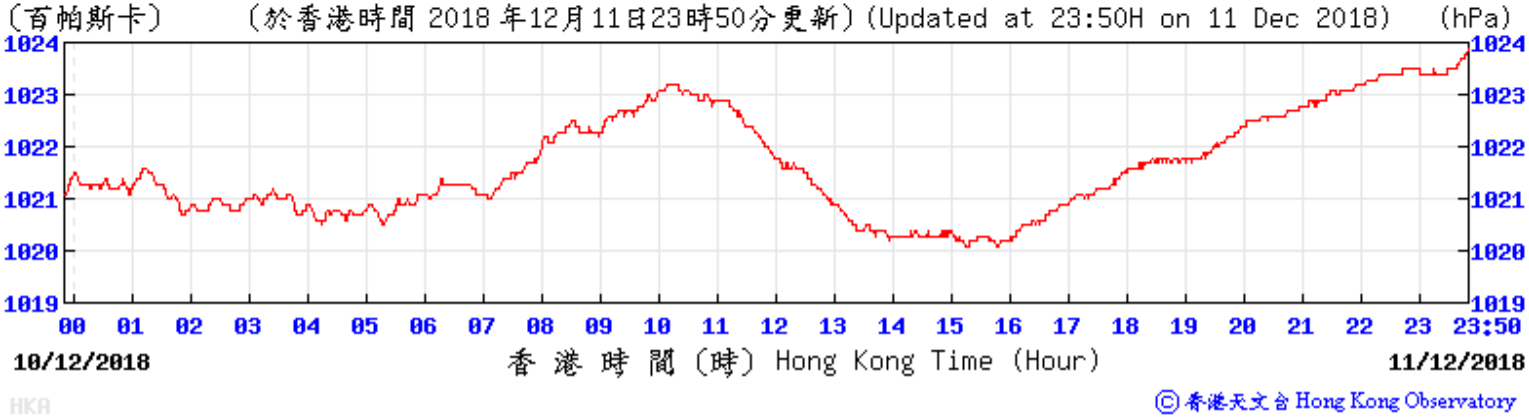
APPENDIX 2

A2. EXTRACT OF METEOROLOGICAL OBSERVATIONS FROM THE HONG KONG AIRPORT OBSERVATORY STATION

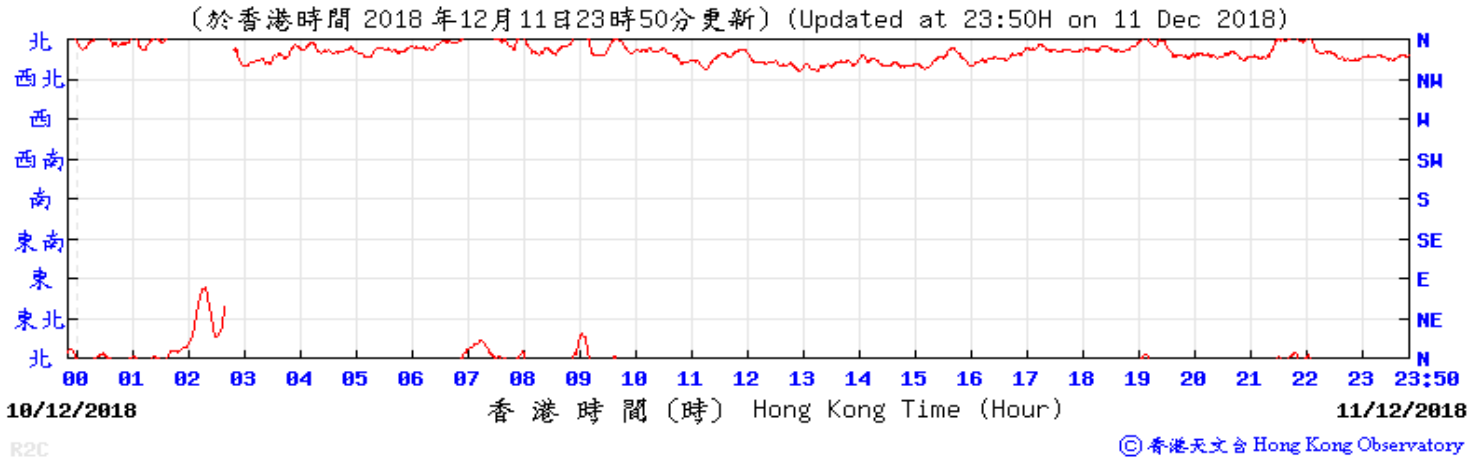
Tempearture/Humidity:



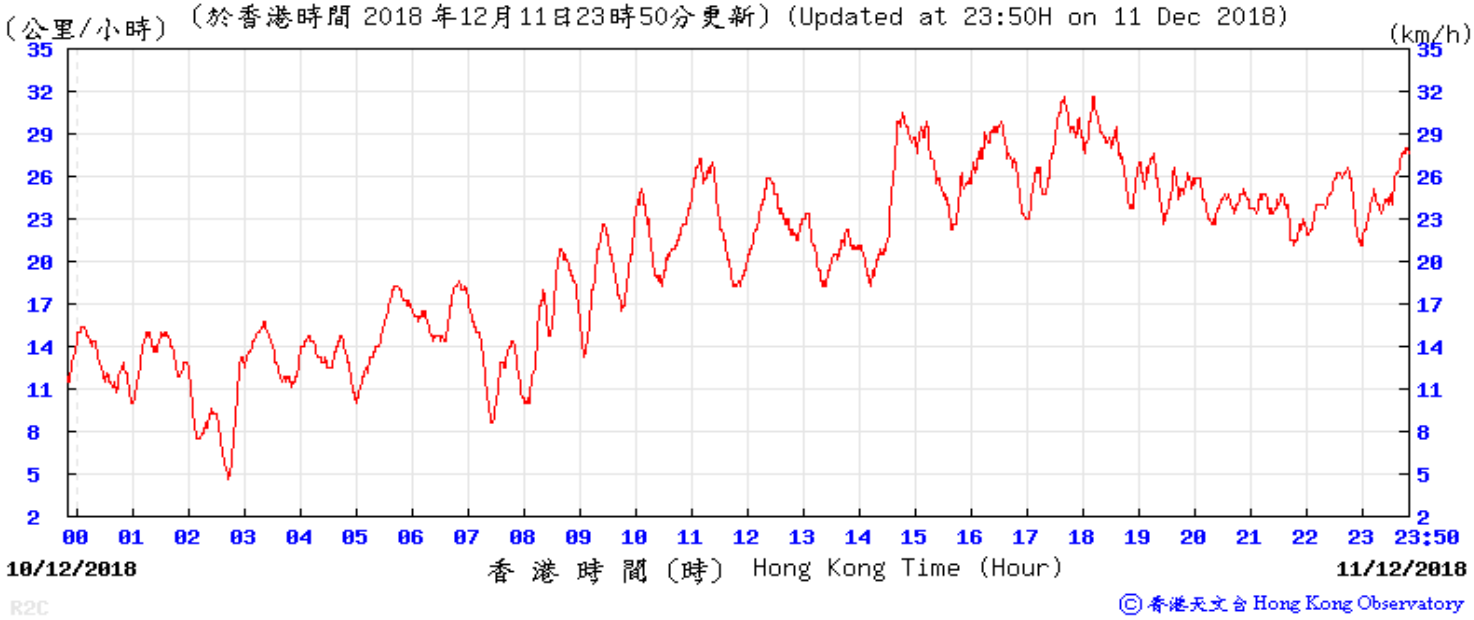
Pressure:



Wind Direction:



Wind Speed:



APPENDIX 3

A3. PHOTO OF THE SAMPLING LOCATION

ALS Technichem (HK) Pty Ltd
1/F, Chung Shun Knitting Centre
1-3 Wing Yip Street
Kwai Chung, N.T., Hong Kong
T +852 2610 1044 F +852 2610 2021

CERTIFICATE OF ANALYSIS

CLIENT:	Oscar Bioenergy Joint Venture	WORK ORDER:	HK1864596
CONTACT:	Mr Edwin Wong		
ADDRESS:	No. 5, Sham Fung Road, Siu Ho Wan, North Lantau Island, NT, Hong Kong	LABORATORY:	Hong Kong
		SUB-BATCH:	0
		DATE RECEIVED:	11 December 2018
		DATE OF ISSUE:	14 December 2018
PROJECT:	Odour Monitoring for the Organic Resources Recovery Centre Phase 1 in Siu Ho Wan	SAMPLE TYPE:	Air
SITE:	Organic Resources Recovery Centre Phase 1 (ORRC1)	NO OF SAMPLES:	3
PO:	---		

COMMENTS

Air sample(s) were collected by ALS Technichem (HK) staff on 11th December, 2018 at the Organic Resources Recovery Centre Phase 1 (ORRC1) in Siu Ho Wan for Odour Monitoring.

The sample(s) were analysed and reported on an as received basis.

NOTES

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.

Richard Fung
General Manager - Hong Kong

METHOD STATEMENT

A. Odour Concentration

1. Odour Sampling

Odour gas sample was collected by passive sampling technique. A Nalophan™ sampling bag was placed inside an air-tight sampler and then drawn to vacuum. Approximately 60 litre of gas sample was collected into the sampling bag for testing.

The odour sample was collected at the Organic Recovery Resources Centre Phase 1 (ORRC1) and sampling location was shown in Appendix A3.

2. Olfactometry Testing

Odour concentration was determined by a Forced-choice Dynamic Olfactometer in accordance with the European Standard Method (EN13725).

This European Standard specifies a method for the objective determination of the odour concentration of a gaseous sample using dynamic olfactometry with human assessors and the emission rate of odours emanating from point sources, area sources with outward flow and area sources without outward flow.

This European Standard is applicable to the measurement of odour concentration of pure substances, defined mixtures and undefined mixtures of gaseous odorants in air or nitrogen, using dynamic olfactometry with a panel of human assessors being the sensor.

The unit of measurement is the odour unit per cubic metre: OU_E/m^3. The odour concentration is measured by determining the dilution factor required to reach the detection threshold. The odour concentration at the detection threshold is by definition 1 OU_E/m^3. The odour concentration is then expressed in terms of multiples of the detection threshold. The range of measurement including pre-dilution prior to the olfactometry analysis is typically from 10^1 OU_E/m^3 to 10^7 OU_E/m^3.

Olfactometry Testing was performed by using the Scentroid™ SS600 Olfactometer. The testing was performed by at least five qualified panellists who have been selected through an n-butanol screening test.

All testing finished within 24 hours after sample receipt.

RESULT

1. Odour Concentration

Sample ID	Location	Sampling Date	Sampling Time	LOR (OU_E/Nm^3)	Odour Concentration (OU_E/Nm^3)	Characteristics of the odour detected of the gas sample	Volumetric Flow Rate (Nm^3/min)	Emission rate (OU_E/hr)
HK1864596-001	CAPC Unit (Bypass AC Filter)	11-Dec-18	15:13 - 15:17	11	476	Decayed orange with minor bleach smell	1419	40,500,000
HK1864596-002	CAPC Unit (Bypass AC Filter)	11-Dec-18	15:19 - 15:23	11	510	Decayed orange with minor bleach smell	1419	43,400,000
HK1864596-003	Field Blank	11-Dec-18	--	11	<11	--	--	--

Remark:
1. LOR denotes limit of reporting.
2. The collected sample volume of the gas bag is sufficient for olfactometry analysis.
3. Field Blank containing pure nitrogen gas was collected and filled by ALS staff.
4. The volumetric flow rate value for calculation of the emission rate was provided by the client.

APPENDIX 1

A1. SITE CONDITIONS AND OBSERVATION

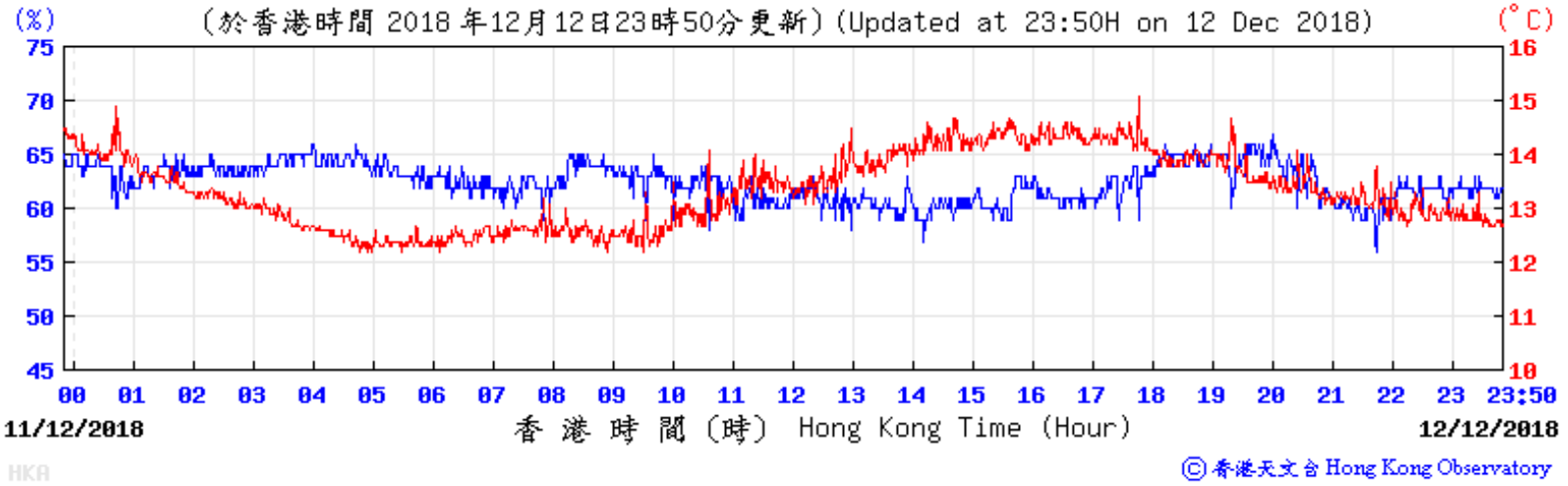
Location	Date	Time	Ambient Temperature (°C)	Relative Humidity (%)	Ambient Pressure (hPa)	Wind Speed (m/s)	Wind Direction (Degree)	Direction from Source[1]	Duration of Odour	On-Site Observation		Weather Condition
										Odour Nature	Possible Source	
CAPC Unit	11-12-18	15:13 - 15:23	18.0	64.7	1017.6	3.0	321	NA	NA	No odour was smelled.	NA	Sunny

Note:
1. It was assumed that the exhaust of the CAPC Unit was from the odour source.

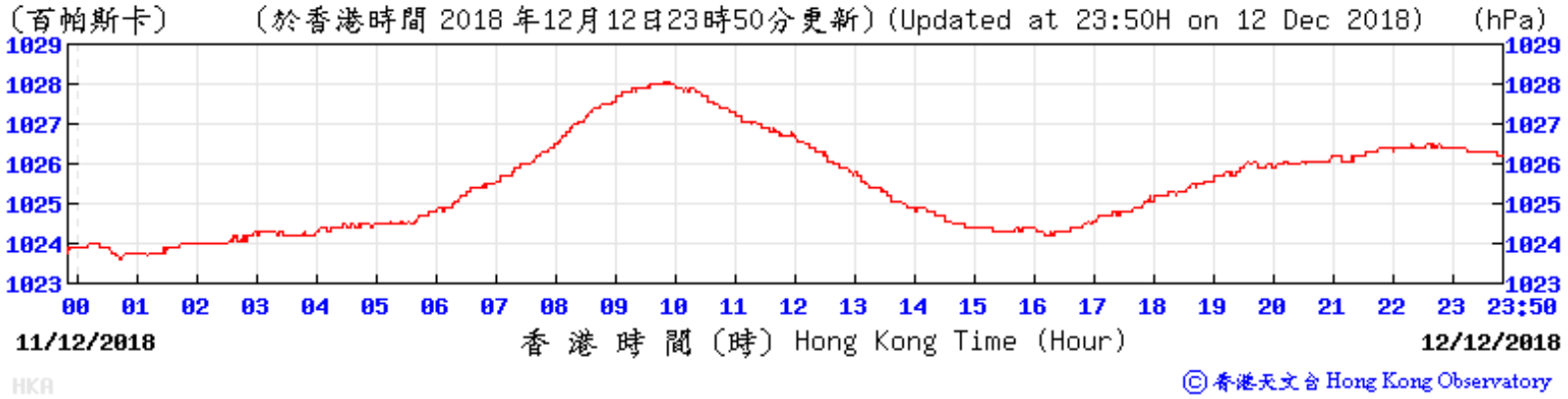
APPENDIX 2

A2. EXTRACT OF METEOROLOGICAL OBSERVATIONS FROM THE HONG KONG AIRPORT OBSERVATORY STATION

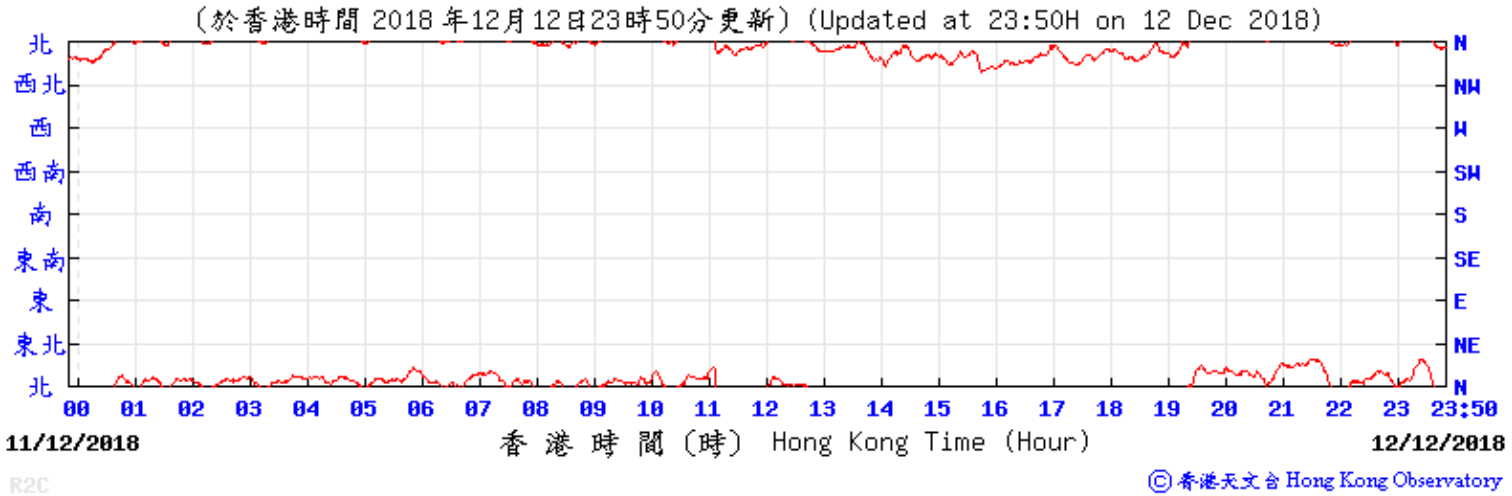
Tempearture/Humidity:



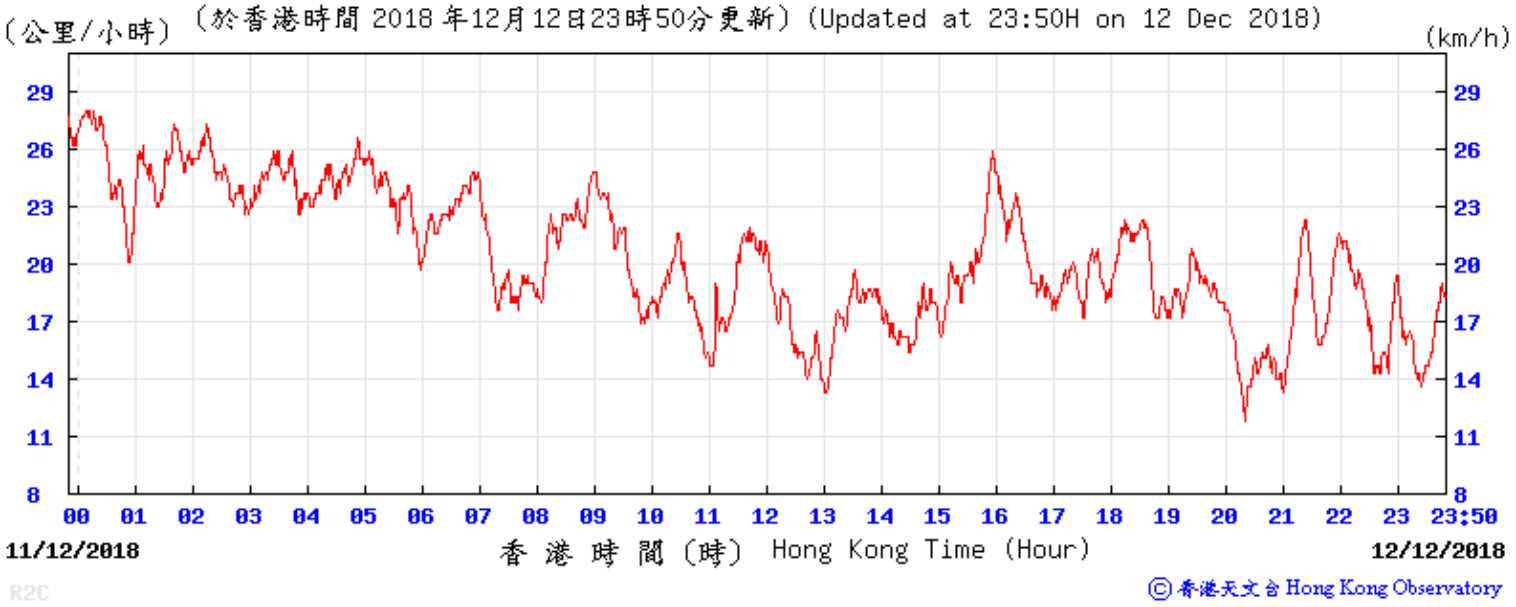
Pressure:



Wind Direction:



Wind Speed:



APPENDIX 3

A3. PHOTO OF THE SAMPLING LOCATION

ALS Technichem (HK) Pty Ltd
11/F, Chung Shun Knitting Centre
1-3 Wing Yip Street
Kwai Chung, N.T., Hong Kong
T +852 2610 1044 F +852 2610 2021

CERTIFICATE OF ANALYSIS

CLIENT:	Oscar Bioenergy Joint Venture	WORK ORDER:	HK1864597
CONTACT:	Mr Edwin Wong		
ADDRESS:	No. 5, Sham Fung Road, Siu Ho Wan, North Lantau Island, NT, Hong Kong	LABORATORY:	Hong Kong
		SUB-BATCH:	0
		DATE RECEIVED:	11 December 2018
		DATE OF ISSUE:	14 December 2018
PROJECT:	Odour Monitoring for the Organic Resources Recovery Centre Phase 1 in Siu Ho Wan	SAMPLE TYPE:	Air
SITE:	Organic Resources Recovery Centre Phase 1 (ORRC1)	NO OF SAMPLES:	3
PO:	---		

COMMENTS

Air sample(s) were collected by ALS Technichem (HK) staff on 11th December, 2018 at the Organic Resources Recovery Centre Phase 1 (ORRC1) in Siu Ho Wan for Odour Monitoring.

The sample(s) were analysed and reported on an as received basis.

NOTES

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.

Richard Fung
General Manager - Hong Kong

METHOD STATEMENT

A. Odour Concentration

1. Odour Sampling

Odour gas sample was collected by passive sampling technique. A Nalophan™ sampling bag was placed inside an air-tight sampler and then drawn to vacuum. Approximately 60 litre of gas sample was collected into the sampling bag for testing.

The odour sample was collected at the Organic Recovery Resources Centre Phase 1 (ORRC1) and sampling location was shown in Appendix A3.

2. Olfactometry Testing

Odour concentration was determined by a Forced-choice Dynamic Olfactometer in accordance with the European Standard Method (EN13725).

This European Standard specifies a method for the objective determination of the odour concentration of a gaseous sample using dynamic olfactometry with human assessors and the emission rate of odours emanating from point sources, area sources with outward flow and area sources without outward flow.

This European Standard is applicable to the measurement of odour concentration of pure substances, defined mixtures and undefined mixtures of gaseous odorants in air or nitrogen, using dynamic olfactometry with a panel of human assessors being the sensor.

The unit of measurement is the odour unit per cubic metre: OU_E/m^3. The odour concentration is measured by determining the dilution factor required to reach the detection threshold. The odour concentration at the detection threshold is by definition 1 OU_E/m^3. The odour concentration is then expressed in terms of multiples of the detection threshold. The range of measurement including pre-dilution prior to the olfactometry analysis is typically from 10^1 OU_E/m^3 to 10^7 OU_E/m^3.

Olfactometry Testing was performed by using the Scentroid™ SS600 Olfactometer. The testing was performed by at least five qualified panellists who have been selected through an n-butanol screening test.

All testing finished within 24 hours after sample receipt.

RESULT

1. Odour Concentration

Sample ID	Location	Sampling Date	Sampling Time	LOR (OU_E/Nm^3)	Odour Concentration (OU_E/Nm^3)	Characteristics of the odour detected of the gas sample	Volumetric Flow Rate (Nm^3/min)	Emission rate (OU_E/hr)
HK1864597-001	CAPC Unit (With AC Filter)	11-Dec-18	15:34 - 15:38	11	414	Decayed orange	1390.1	34,500,000
HK1864597-002	CAPC Unit (With AC Filter)	11-Dec-18	15:38 - 15:43	11	443	Decayed orange	1390.1	37,000,000
HK1864597-003	Field Blank	11-Dec-18	--	11	<11	--	--	--

Remark:
1. LOR denotes limit of reporting.
2. The collected sample volume of the gas bag is sufficient for olfactometry analysis.
3. Field Blank containing pure nitrogen gas was collected and filled by ALS staff.
4. The volumetric flow rate value for calculation of the emission rate was provided by the client.

APPENDIX 1

A1. SITE CONDITIONS AND OBSERVATION

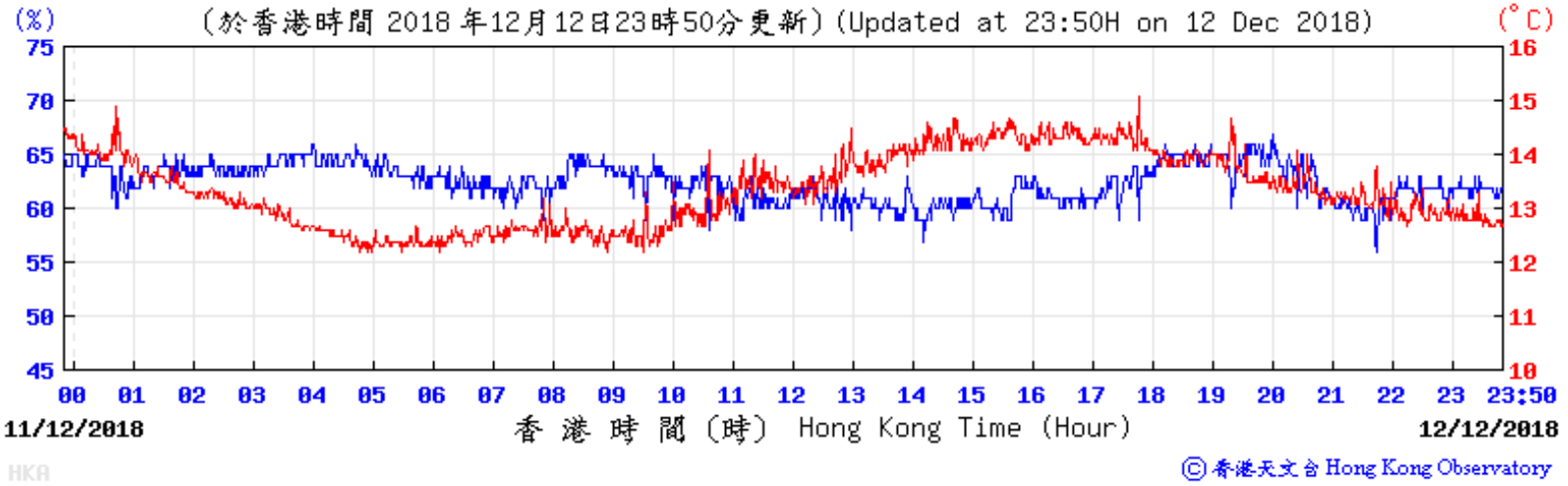
Location	Date	Time	Ambient Temperature (°C)	Relative Humidity (%)	Ambient Pressure (hPa)	Wind Speed (m/s)	Wind Direction (Degree)	Direction from Source[1]	Duration of Odour	On-Site Observation		Weather Condition
										Odour Nature	Possible Source	
CAPC Unit	11-12-18	15:34 - 15:43	18.3	64.0	1017.6	2.5	281	NA	NA	No odour was smelled.	NA	Sunny

Note:
1. It was assumed that the exhaust of the CAPC Unit was from the odour source.

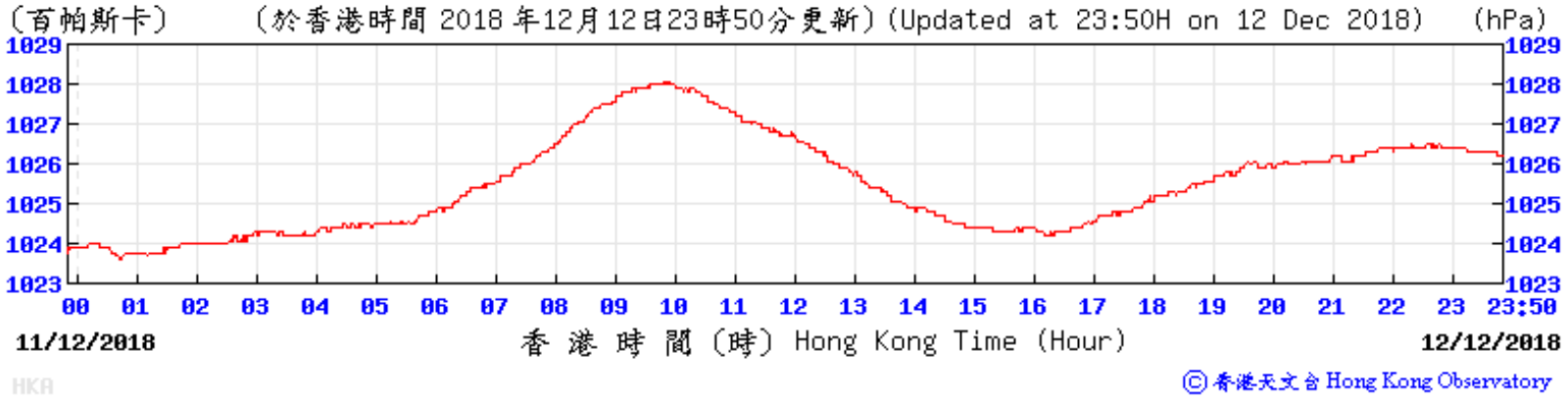
APPENDIX 2

A2. EXTRACT OF METEOROLOGICAL OBSERVATIONS FROM THE HONG KONG AIRPORT OBSERVATORY STATION

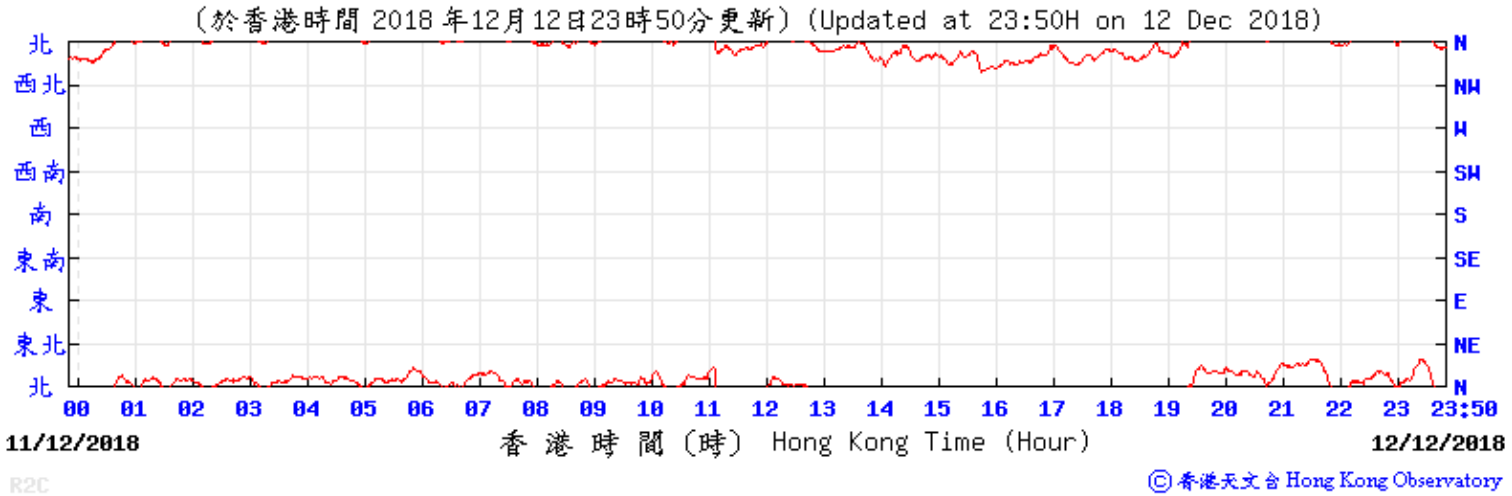
Tempearture/Humidity:



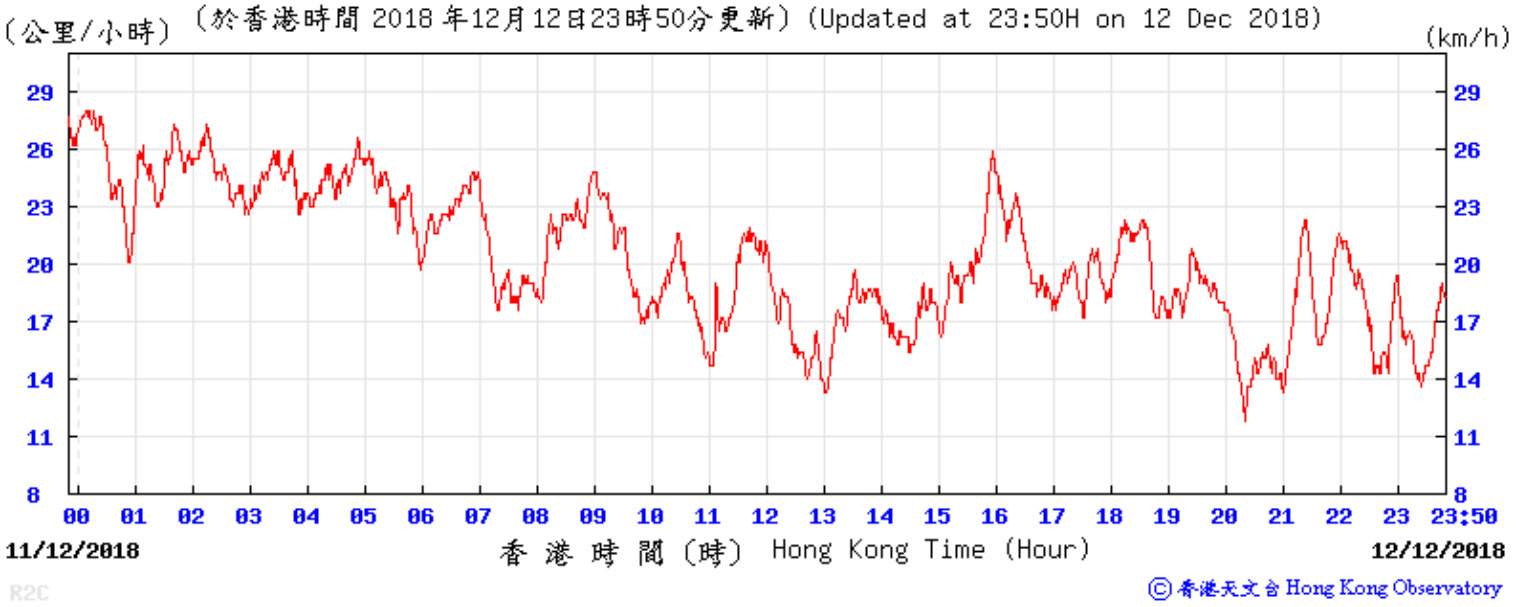
Pressure:



Wind Direction:



Wind Speed:



APPENDIX 3

A3. PHOTO OF THE SAMPLING LOCATION

ALS Technichem (HK) Pty Ltd
11/F, Chung Shun Knitting Centre
1-3 Wing Yip Street
Kwai Chung, N.T., Hong Kong
T +852 2610 1044 F +852 2610 2021

CERTIFICATE OF ANALYSIS

CLIENT:	Oscar Bioenergy Joint Venture	WORK ORDER:	HK1866002
CONTACT:	Mr Edwin Wong		
ADDRESS:	No. 5, Sham Fung Road, Siu Ho Wan, North Lantau Island, NT, Hong Kong	LABORATORY:	Hong Kong
		SUB-BATCH:	0
		DATE RECEIVED:	19 December 2018
		DATE OF ISSUE:	2 January 2019
PROJECT:	Odour Monitoring for the Organic Resources Recovery Centre Phase 1 in Siu Ho Wan	SAMPLE TYPE:	Air
SITE:	Organic Resources Recovery Centre Phase 1 (ORRC1)	NO OF SAMPLES:	3
PO:	---		

COMMENTS

Air sample(s) were collected by ALS Technichem (HK) staff on 19th December, 2018 at the Organic Resources Recovery Centre Phase 1 (ORRC1) in Siu Ho Wan for Odour Monitoring.

The sample(s) were analysed and reported on an as received basis.

NOTES

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.

Richard Fung
General Manager - Hong Kong

METHOD STATEMENT

A. Odour Concentration

1. Odour Sampling

Odour gas sample was collected by passive sampling technique. A Nalophan™ sampling bag was placed inside an air-tight sampler and then drawn to vacuum. Approximately 60 litre of gas sample was collected into the sampling bag for testing.

The odour sample was collected at the Organic Recovery Resources Centre Phase 1 (ORRC1) and sampling location was shown in Appendix A3.

2. Olfactometry Testing

Odour concentration was determined by a Forced-choice Dynamic Olfactometer in accordance with the European Standard Method (EN13725).

This European Standard specifies a method for the objective determination of the odour concentration of a gaseous sample using dynamic olfactometry with human assessors and the emission rate of odours emanating from point sources, area sources with outward flow and area sources without outward flow.

This European Standard is applicable to the measurement of odour concentration of pure substances, defined mixtures and undefined mixtures of gaseous odorants in air or nitrogen, using dynamic olfactometry with a panel of human assessors being the sensor.

The unit of measurement is the odour unit per cubic metre: OU_E/m^3. The odour concentration is measured by determining the dilution factor required to reach the detection threshold. The odour concentration at the detection threshold is by definition 1 OU_E/m^3. The odour concentration is then expressed in terms of multiples of the detection threshold. The range of measurement including pre-dilution prior to the olfactometry analysis is typically from 10^1 OU_E/m^3 to 10^7 OU_E/m^3.

Olfactometry Testing was performed by using the Scentroid™ SS600 Olfactometer. The testing was performed by at least five qualified panellists who have been selected through an n-butanol screening test.

All testing finished within 24 hours after sample receipt.

RESULT

1. Odour Concentration

Sample ID	Location	Sampling Date	Sampling Time	LOR (OU_E/Nm^3)	Odour Concentration (OU_E/Nm^3)	Characteristics of the odour detected of the gas sample	Volumetric Flow Rate (Nm^3/min)	Emission rate (OU_E/hr)
HK1866002-001	CAPC Unit (With AC Filter)	19-Dec-18	15:08 - 15:12	11	1164	Musty smell	1856.4	130,000,000
HK1866002-002	CAPC Unit (With AC Filter)	19-Dec-18	15:29 - 15:33	11	1016	Musty smell	1856.4	113,000,000
HK1866002-003	Field Blank	19-Dec-18	--	11	<11	--	--	--

Remark:
1. LOR denotes limit of reporting.
2. The collected sample volume of the gas bag is sufficient for olfactometry analysis.
3. Field Blank containing pure nitrogen gas was collected and filled by ALS staff.
4. The volumetric flow rate value for calculation of the emission rate was provided by the client.

APPENDIX 1

A1. SITE CONDITIONS AND OBSERVATION

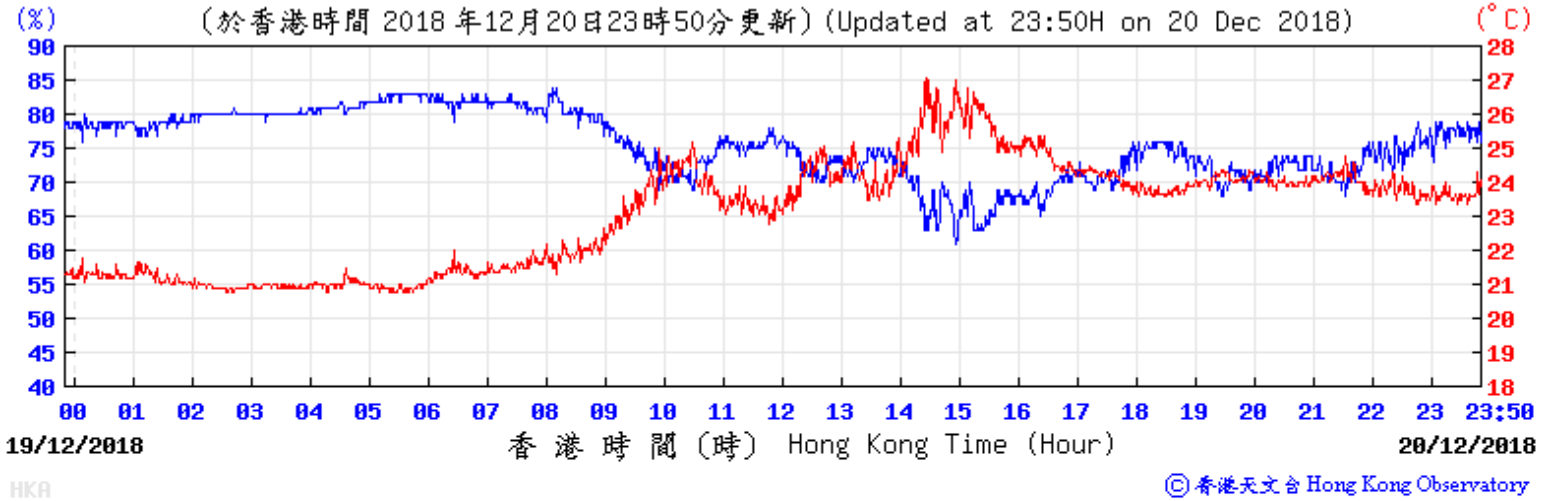
Location	Date	Time	Ambient Temperature (°C)	Relative Humidity (%)	Ambient Pressure (hPa)	Wind Speed (m/s)	Wind Direction (Degree)	Direction from Source[1]	Duration of Odour	On-Site Observation		Weather Condition
										Odour Nature	Possible Source	
CAPC Unit	19-12-18	15:08 - 15:33	21.5	72.0	1014.9	3.6	335	Yes	Continuous	Bleaching with musty smell	From the Chimney	Cloudy

Note:
1. It was assumed that the exhaust of the CAPC Unit was from the odour source.

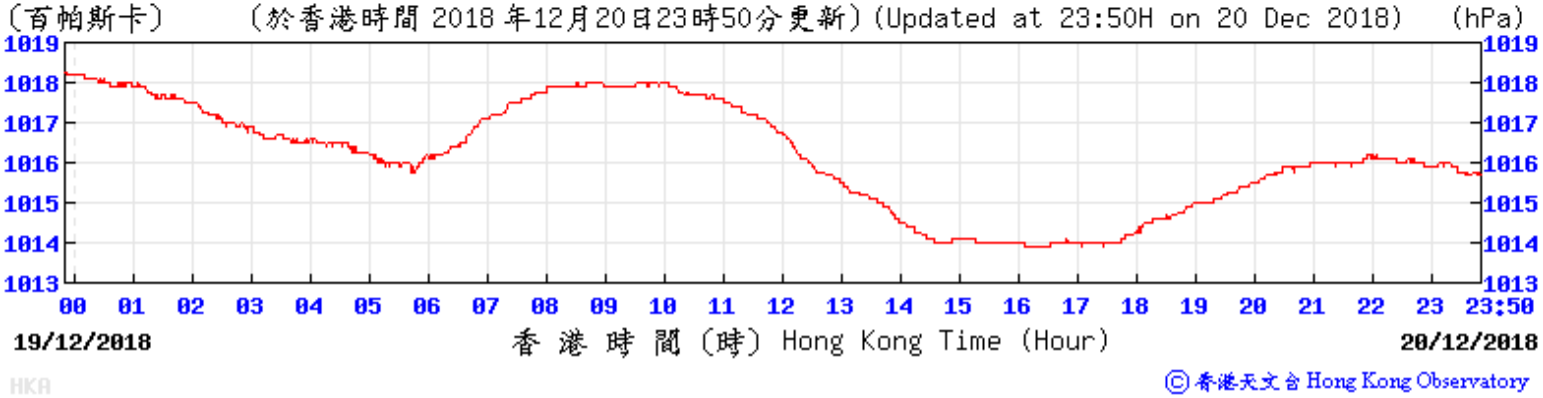
APPENDIX 2

A2. EXTRACT OF METEOROLOGICAL OBSERVATIONS FROM THE HONG KONG AIRPORT OBSERVATORY STATION

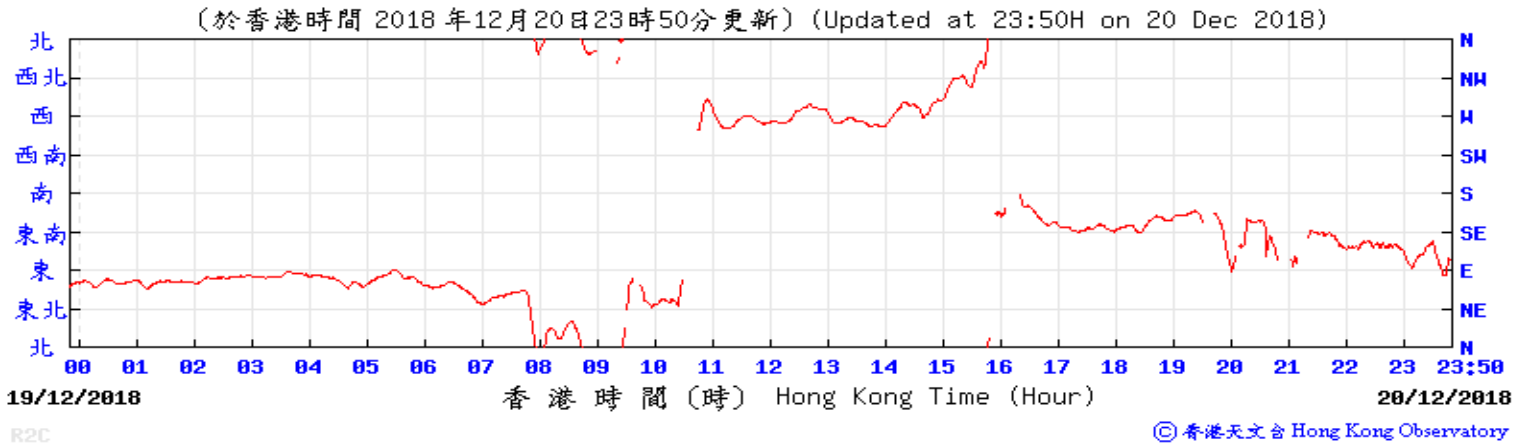
Tempearture/Humidity:



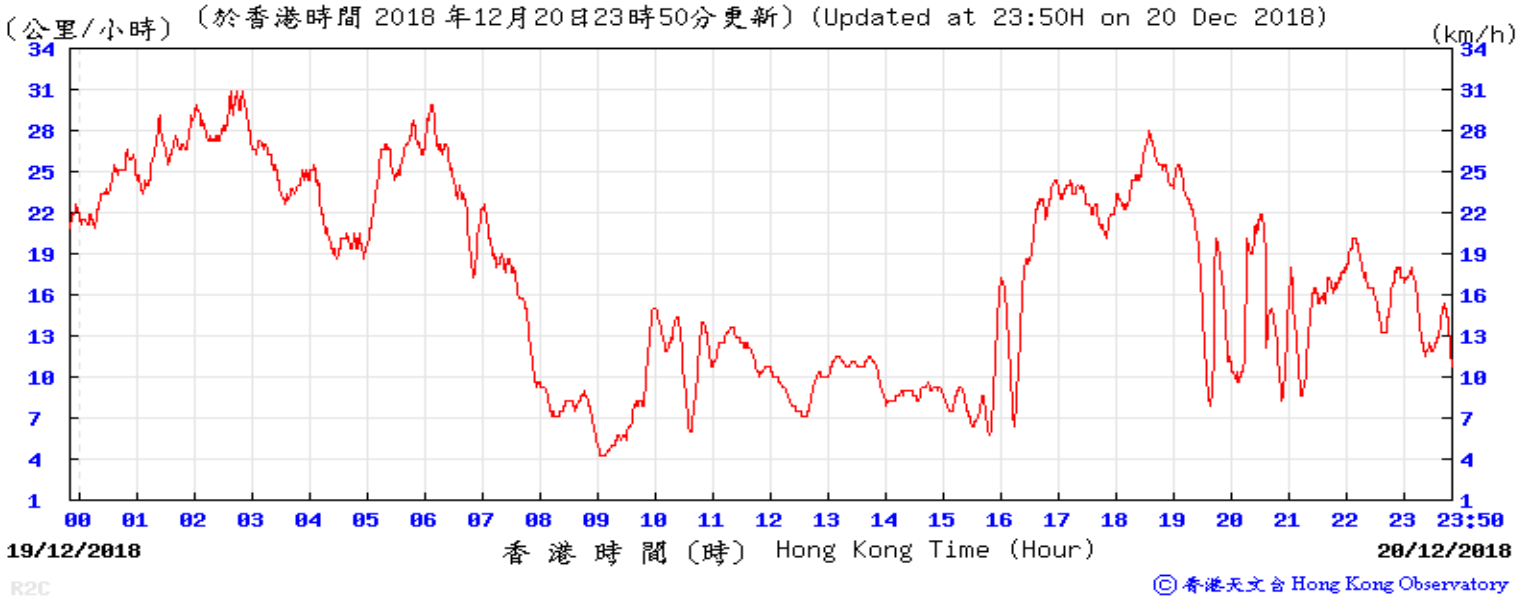
Pressure:



Wind Direction:



Wind Speed:



APPENDIX 3

A3. PHOTO OF THE SAMPLING LOCATION

ALS Technichem (HK) Pty Ltd
11/F, Chung Shun Knitting Centre
1-3 Wing Yip Street
Kwai Chung, N.T., Hong Kong
T +852 2610 1044 F +852 2610 2021

CERTIFICATE OF ANALYSIS

CLIENT:	Oscar Bioenergy Joint Venture	WORK ORDER:	HK1866721
CONTACT:	Mr Edwin Wong		
ADDRESS:	No. 5, Sham Fung Road, Siu Ho Wan, North Lantau Island, NT, Hong Kong	LABORATORY:	Hong Kong
		SUB-BATCH:	0
		DATE RECEIVED:	27 December 2018
		DATE OF ISSUE:	2 January 2019
PROJECT:	Odour Monitoring for the Organic Resources Recovery Centre Phase 1 in Siu Ho Wan	SAMPLE TYPE:	Air
SITE:	Organic Resources Recovery Centre Phase 1 (ORRC1)	NO OF SAMPLES:	5
PO:	---		

COMMENTS

Air sample(s) were collected by ALS Technichem (HK) staff on 27th December, 2018 at the Organic Resources Recovery Centre Phase 1 (ORRC1) in Siu Ho Wan for Odour Monitoring.

The sample(s) were analysed and reported on an as received basis.

NOTES

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.

Richard Fung
General Manager Hong Kong

METHOD STATEMENT

A. Odour Concentration

1. Odour Sampling

Odour gas sample was collected by passive sampling technique. A Nalophan™ sampling bag was placed inside an air-tight sampler and then drawn to vacuum. Approximately 60 litre of gas sample was collected into the sampling bag for testing.

The odour sample was collected at the Organic Recovery Resources Centre Phase 1 (ORRC1) and sampling location was shown in Appendix A3.

2. Olfactometry Testing

Odour concentration was determined by a Forced-choice Dynamic Olfactometer in accordance with the European Standard Method (EN13725).

This European Standard specifies a method for the objective determination of the odour concentration of a gaseous sample using dynamic olfactometry with human assessors and the emission rate of odours emanating from point sources, area sources with outward flow and area sources without outward flow.

This European Standard is applicable to the measurement of odour concentration of pure substances, defined mixtures and undefined mixtures of gaseous odorants in air or nitrogen, using dynamic olfactometry with a panel of human assessors being the sensor.

The unit of measurement is the odour unit per cubic metre: OU_E/m^3. The odour concentration is measured by determining the dilution factor required to reach the detection threshold. The odour concentration at the detection threshold is by definition 1 OU_E/m^3. The odour concentration is then expressed in terms of multiples of the detection threshold. The range of measurement including pre-dilution prior to the olfactometry analysis is typically from 10^1 OU_E/m^3 to 10^7 OU_E/m^3.

Olfactometry Testing was performed by using the Scentroid™ SS600 Olfactometer. The testing was performed by at least five qualified panellists who have been selected through an n-butanol screening test.

All testing finished within 24 hours after sample receipt.

RESULT

1. Odour Concentration

Sample ID	Location	Sampling Date	Sampling Time	LOR (OU_E/Nm^3)	Odour Concentration (OU_E/Nm^3)	Characteristics of the odour detected of the gas sample	Volumetric Flow Rate (Nm^3/min)	Emission rate (OU_E/hr)
HK1866721-001	CAPC Unit (with AC Filter)	27-Dec-18	14:07 – 14:10	11	1026	Bleach with minor garbage smell	1871.6	115,000,000
HK1866721-002	CAPC Unit (with AC Filter)	27-Dec-18	14:11 – 14:14	11	1026	Bleach with minor garbage smell	1871.6	115,000,000
HK1866721-003	CAPC Unit (Bypass AC Filter)	27-Dec-18	14:45 – 14:48	11	1087	Bleach smell	2003.6	131,000,000
HK1866721-004	CAPC Unit (Bypass AC Filter)	27-Dec-18	14:49 – 14:53	11	1087	Bleach smell	2003.6	131,000,000
HK1866721-005	Field Blank	27-Dec-18	--	11	<11	--	--	--

Remark:
1. LOR denotes limit of reporting.
2. The collected sample volume of the gas bag is sufficient for olfactometry analysis.
3. Field Blank containing pure nitrogen gas was collected and filled by ALS staff.
4. The volumetric flow rate value for calculation of the emission rate was provided by the client.

APPENDIX 1

A1. SITE CONDITIONS AND OBSERVATION

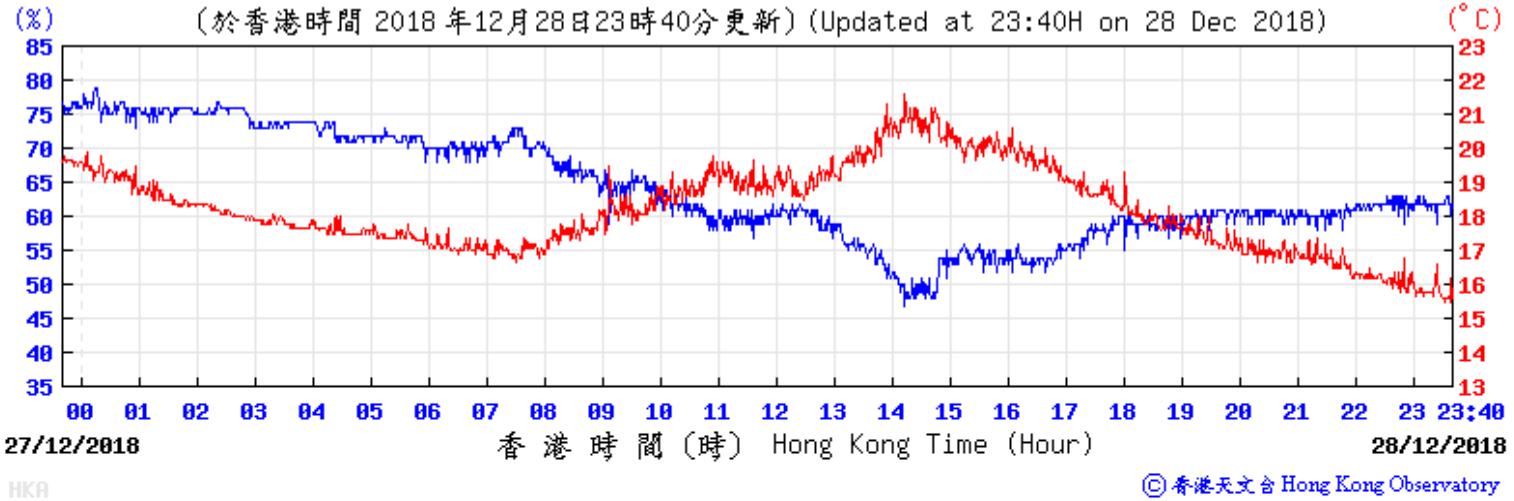
Location	Date	Time	Ambient Temperature (°C)	Relative Humidity (%)	Ambient Pressure (hPa)	Wind Speed (m/s)	Wind Direction (Degree)	Direction from Source[1]	Duration of Odour	On-Site Observation		Weather Condition
										Odour Nature	Possible Source	
CAPC Unit	27-12-18	14:07 - 14:53	23.3	68.8	1012.5	0.8	320	NA	NA	No odour was detected.	NA	Sunny

Note:
1. It was assumed that the exhaust of the CAPC Unit was from the odour source.

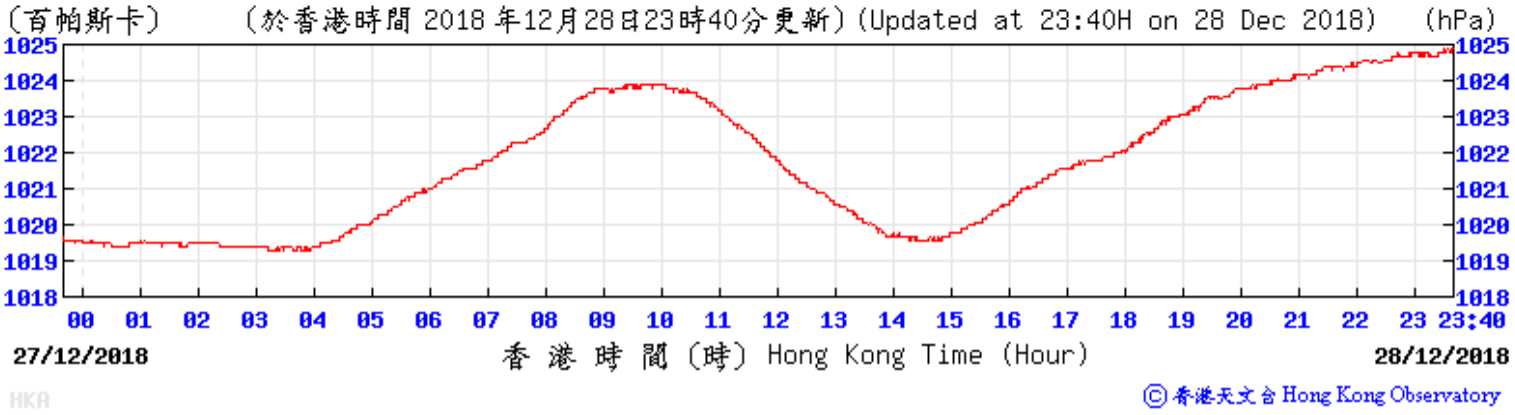
APPENDIX 2

A2. EXTRACT OF METEOROLOGICAL OBSERVATIONS FROM THE HONG KONG AIRPORT OBSERVATORY STATION

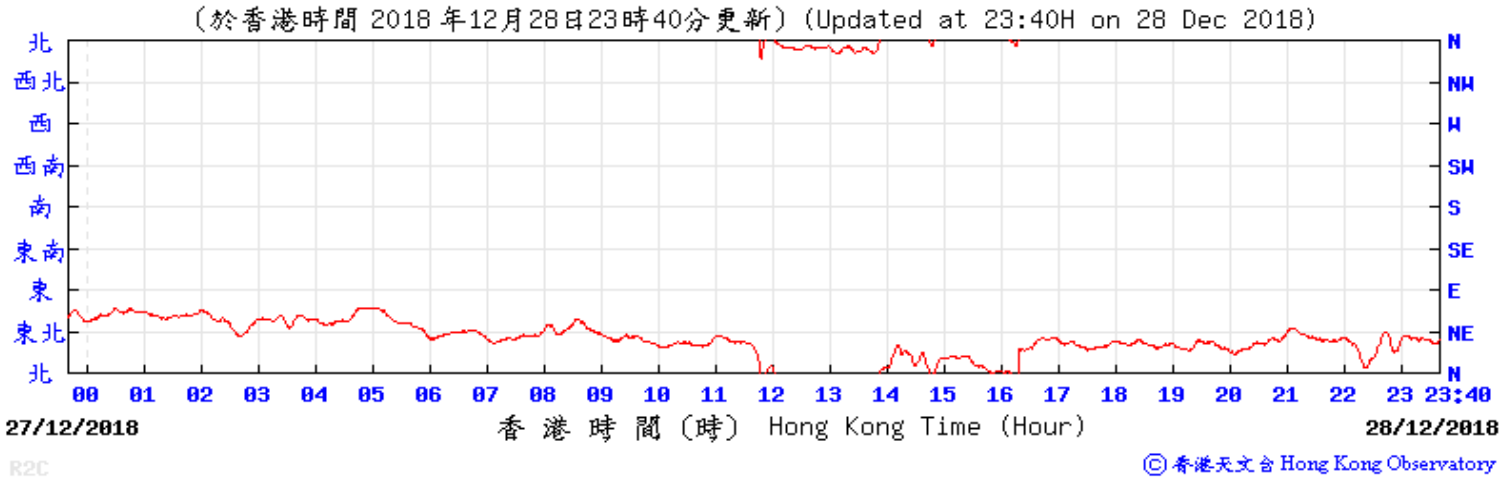
Tempearture/Humidity:



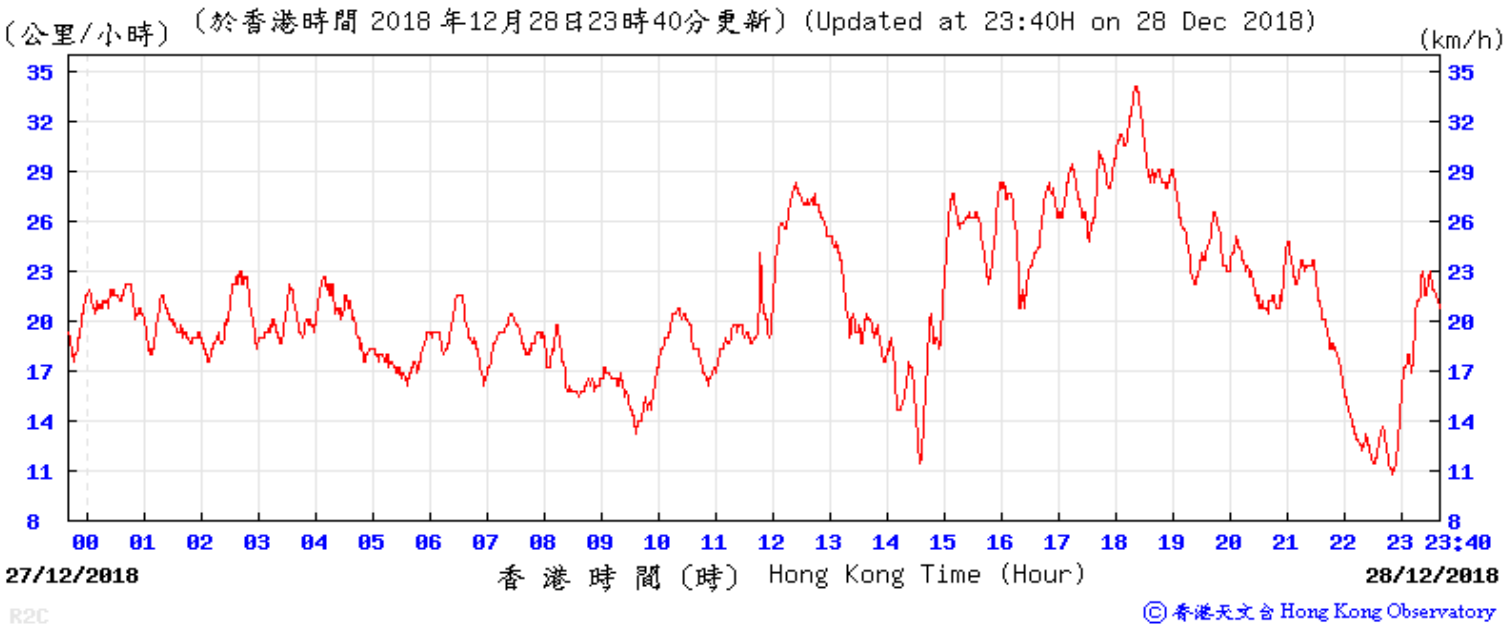
Pressure:



Wind Direction:



Wind Speed:



APPENDIX 3

A3. PHOTO OF THE SAMPLING LOCATION

ALS Technichem (HK) Pty Ltd
T1/F, Chung Shun Knitting Centre
1-3 Wing Yip Street
Kwai Chung, N.T., Hong Kong
T +852 2610 1044 F +852 2610 2021

CERTIFICATE OF ANALYSIS

CLIENT:	Oscar Bioenergy Joint Venture	WORK ORDER:	HK1902606
CONTACT:	Mr Edwin Wong		
ADDRESS:	No. 5, Sham Fung Road, Siu Ho Wan, North Lantau Island, NT, Hong Kong	LABORATORY:	Hong Kong
		SUB-BATCH:	0
		DATE RECEIVED:	16 January 2019
		DATE OF ISSUE:	30 January 2019
PROJECT:	Odour Monitoring for the Organic Resources Recovery Centre Phase 1 in Siu Ho Wan	SAMPLE TYPE:	Air
SITE:	Organic Resources Recovery Centre Phase 1 (ORRC1)	NO OF SAMPLES:	3
PO:	---		

COMMENTS

Air sample(s) were collected by ALS Technichem (HK) staff on 16th January, 2019 at the Organic Resources Recovery Centre Phase 1 (ORRC1) in Siu Ho Wan for Odour Monitoring.

The sample(s) were analysed and reported on an as received basis.

NOTES

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.

Richard Fung
General Manager - Hong Kong

METHOD STATEMENT

A. Odour Concentration

1. Odour Sampling

Odour gas sample was collected by passive sampling technique. A Nalophan™ sampling bag was placed inside an air-tight sampler and then drawn to vacuum. Approximately 60 litre of gas sample was collected into the sampling bag for testing.

The odour sample was collected at the Organic Recovery Resources Centre Phase 1 (ORRC1) and sampling location was shown in Appendix A2.

2. Olfactometry Testing

Odour concentration was determined by a Forced-choice Dynamic Olfactometer in accordance with the European Standard Method (EN13725).

This European Standard specifies a method for the objective determination of the odour concentration of a gaseous sample using dynamic olfactometry with human assessors and the emission rate of odours emanating from point sources, area sources with outward flow and area sources without outward flow.

This European Standard is applicable to the measurement of odour concentration of pure substances, defined mixtures and undefined mixtures of gaseous odorants in air or nitrogen, using dynamic olfactometry with a panel of human assessors being the sensor.

The unit of measurement is the odour unit per cubic metre: OU_E/m^3. The odour concentration is measured by determining the dilution factor required to reach the detection threshold. The odour concentration at the detection threshold is by definition 1 OU_E/m^3. The odour concentration is then expressed in terms of multiples of the detection threshold. The range of measurement including pre-dilution prior to the olfactometry analysis is typically from 10^1 ou_E/m^3 to 10^7 ou_E/m^3.

Olfactometry Testing was performed by using the Scentroid™ SS600 Olfactometer. The testing was performed by at least five qualified panellists who have been selected through an n-butanol screening test.

All testing finished within 24 hours after sample receipt.

RESULT

Odour Concentration

Sample ID	Location	Sampling Date	Sampling Time	LOR (ou_E/Nm^3)	Odour Concentration (ou_E/Nm^3)	Characteristics of the odour detected of the gas sample	Volumetric Flow Rate (Nm^3/min)	Emission rate (ou_E/hr)
HK1902606-001	CAPC Unit (Low ORP)	16-Jan-19	13:42 - 13:45	11	444	Bleaching smell	2289.2	61,000,000
HK1902606-002	CAPC Unit (Low ORP)	16-Jan-19	13:48 - 13:52	11	476	Bleaching smell	2289.2	65,000,000
HK1902606-003	Field Blank	16-Jan-19	--	11	<11	--	--	--

Remark:
1. LOR denotes limit of reporting.
2. The collected sample volume of the gas bag is sufficient for olfactometry analysis.
3. Field Blank containing pure nitrogen gas was collected and filled by ALS staff.
4. The volumetric flow rate value for calculation of the emission rate was provided by the client.

APPENDIX 1

A1. SITE CONDITIONS AND OBSERVATION

Location	Date	Time	Ambient Temperature (°C)	Relative Humidity (%)	Ambient Pressure (hPa)	Wind Speed (m/s)	Wind Direction (Degree)	Direction from Source[1]	Duration of Odour	On-Site Observation		Weather Condition
										Odour Nature	Possible Source	
CAPC Unit	16-1-19	13:42 - 13:52	18.6	70.0	1017.9	2.2	324	NA	NA	No odour was smelled.	NA	Cloudy

Note:
1. It was assumed that the exhaust of the CAPC Unit was from the odour source.

APPENDIX 2

A2. PHOTO OF THE SAMPLING LOCATION

ALS Technichem (HK) Pty Ltd
11/F, Chung Shun Knitting Centre
1-3 Wing Yip Street
Kwai Chung, N.T., Hong Kong
T +852 2610 1044 F +852 2610 2021

CERTIFICATE OF ANALYSIS

CLIENT:	Oscar Bioenergy Joint Venture	WORK ORDER:	HK1902870
CONTACT:	Mr Edwin Wong		
ADDRESS:	No. 5, Sham Fung Road, Siu Ho Wan, North Lantau Island, NT, Hong Kong	LABORATORY:	Hong Kong
		SUB-BATCH:	0
		DATE RECEIVED:	16 January 2019
		DATE OF ISSUE:	30 January 2019
PROJECT:	Odour Monitoring for the Organic Resources Recovery Centre Phase 1 in Siu Ho Wan	SAMPLE TYPE:	Air
SITE:	Organic Resources Recovery Centre Phase 1 (ORRC1)	NO OF SAMPLES:	3
PO:	---		

COMMENTS

Air sample(s) were collected by ALS Technichem (HK) staff on 16th January, 2019 at the Organic Resources Recovery Centre Phase 1 (ORRC1) in Siu Ho Wan for Odour Monitoring.

The sample(s) were analysed and reported on an as received basis.

NOTES

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.

Richard Fung
General Manager - Hong Kong

METHOD STATEMENT

A. Odour Concentration

1. Odour Sampling

Odour gas sample was collected by passive sampling technique. A Nalophan™ sampling bag was placed inside an air-tight sampler and then drawn to vacuum. Approximately 60 litre of gas sample was collected into the sampling bag for testing.

The odour sample was collected at the Organic Recovery Resources Centre Phase 1 (ORRC1) and sampling location was shown in Appendix A2.

2. Olfactometry Testing

Odour concentration was determined by a Forced-choice Dynamic Olfactometer in accordance with the European Standard Method (EN13725).

This European Standard specifies a method for the objective determination of the odour concentration of a gaseous sample using dynamic olfactometry with human assessors and the emission rate of odours emanating from point sources, area sources with outward flow and area sources without outward flow.

This European Standard is applicable to the measurement of odour concentration of pure substances, defined mixtures and undefined mixtures of gaseous odorants in air or nitrogen, using dynamic olfactometry with a panel of human assessors being the sensor.

The unit of measurement is the odour unit per cubic metre: OU_E/m^3. The odour concentration is measured by determining the dilution factor required to reach the detection threshold. The odour concentration at the detection threshold is by definition 1 OU_E/m^3. The odour concentration is then expressed in terms of multiples of the detection threshold. The range of measurement including pre-dilution prior to the olfactometry analysis is typically from 10^1 ou_E/m^3 to 10^7 ou_E/m^3.

Olfactometry Testing was performed by using the Scentroid™ SS600 Olfactometer. The testing was performed by at least five qualified panellists who have been selected through an n-butanol screening test.

All testing finished within 24 hours after sample receipt.

RESULT

Odour Concentration

Sample ID	Location	Sampling Date	Sampling Time	LOR (ou_E/Nm^3)	Odour Concentration (ou_E/Nm^3)	Characteristics of the odour detected of the gas sample	Volumetric Flow Rate (Nm^3/min)	Emission rate (ou_E/hr)
HK1902870-001	CAPC Unit (High ORP)	16-Jan-19	15:54 - 15:57	11	546	Bleaching smell	2285.2	75,000,000
HK1902870-002	CAPC Unit (High ORP)	16-Jan-19	15:58 - 16:02	11	509	Bleaching smell	2285.2	70,000,000
HK1902870-003	Field Blank	16-Jan-19	--	11	<11	--	--	--

Remark:
1. LOR denotes limit of reporting.
2. The collected sample volume of the gas bag is sufficient for olfactometry analysis.
3. Field Blank containing pure nitrogen gas was collected and filled by ALS staff.
4. The volumetric flow rate value for calculation of the emission rate was provided by the client.

APPENDIX 1

A1. SITE CONDITIONS AND OBSERVATION

Location	Date	Time	Ambient Temperature (°C)	Relative Humidity (%)	Ambient Pressure (hPa)	Wind Speed (m/s)	Wind Direction (Degree)	Direction from Source[1]	Duration of Odour	On-Site Observation		Weather Condition
										Odour Nature	Possible Source	
CAPC Unit	16-1-19	15:54 - 16:02	17.8	63.9	1017.9	1.2	322	NA	NA	No odour was smelled.	NA	Cloudy

Note:
1. It was assumed that the exhaust of the CAPC Unit was from the odour source.

APPENDIX 2

A2. PHOTO OF THE SAMPLING LOCATION

ALS Technichem (HK) Pty Ltd
11/F, Chung Shun Knitting Centre
1-3 Wing Yip Street
Kwai Chung, N.T., Hong Kong
T +852 2610 1044 F +852 2610 2021

CERTIFICATE OF ANALYSIS

CLIENT:	Oscar Bioenergy Joint Venture	WORK ORDER:	HK1904547
CONTACT:	Mr Edwin Wong		
ADDRESS:	No. 5, Sham Fung Road, Siu Ho Wan, North Lantau Island, NT, Hong Kong	LABORATORY:	Hong Kong
		SUB-BATCH:	0
		DATE RECEIVED:	29 January 2019
		DATE OF ISSUE:	13 February 2019
PROJECT:	Odour Monitoring for the Organic Resources Recovery Centre Phase 1 in Siu Ho Wan	SAMPLE TYPE:	Air
SITE:	Organic Resources Recovery Centre Phase 1 (ORRC1)	NO OF SAMPLES:	3
PO:	---		

COMMENTS

Air sample(s) were collected by ALS Technichem (HK) staff on 29th January, 2019 at the Organic Resources Recovery Centre Phase 1 (ORRC1) in Siu Ho Wan for Odour Monitoring.

The sample(s) were analysed and reported on an as received basis.

NOTES

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.

Richard Fung
General Manager - Hong Kong

METHOD STATEMENT

A. Odour Concentration

1. Odour Sampling

Odour gas sample was collected by passive sampling technique. A Nalophan™ sampling bag was placed inside an air-tight sampler and then drawn to vacuum. Approximately 60 litre of gas sample was collected into the sampling bag for testing.

The odour sample was collected at the Organic Recovery Resources Centre Phase 1 (ORRC1) and sampling location was shown in Appendix A2.

2. Olfactometry Testing

Odour concentration was determined by a Forced-choice Dynamic Olfactometer in accordance with the European Standard Method (EN13725).

This European Standard specifies a method for the objective determination of the odour concentration of a gaseous sample using dynamic olfactometry with human assessors and the emission rate of odours emanating from point sources, area sources with outward flow and area sources without outward flow.

This European Standard is applicable to the measurement of odour concentration of pure substances, defined mixtures and undefined mixtures of gaseous odorants in air or nitrogen, using dynamic olfactometry with a panel of human assessors being the sensor.

The unit of measurement is the odour unit per cubic metre: OU_E/m^3. The odour concentration is measured by determining the dilution factor required to reach the detection threshold. The odour concentration at the detection threshold is by definition 1 OU_E/m^3. The odour concentration is then expressed in terms of multiples of the detection threshold. The range of measurement including pre-dilution prior to the olfactometry analysis is typically from 10^1 ou_E/m^3 to 10^7 ou_E/m^3.

Olfactometry Testing was performed by using the Scentroid™ SS600 Olfactometer. The testing was performed by at least five qualified panellists who have been selected through an n-butanol screening test.

All testing finished within 24 hours after sample receipt.

RESULT

Odour Concentration

Sample ID	Location	Sampling Date	Sampling Time	LOR (ou_E/Nm^3)	Odour Concentration (ou_E/Nm^3)	Characteristics of the odour detected of the gas sample	Volumetric Flow Rate (Nm^3/min)	Emission rate (ou_E/hr)
HK1904547-001	CAPC	29-Jan-19	14:00 - 14:04	11	116	Garbage smell with minor fishy smell	2552.4	17,800,000
HK1904547-002	CAPC	29-Jan-19	14:04 - 14:08	11	93	Garbage smell with minor fishy smell	2552.4	14,200,000
HK1904547-003	Field Blank	29-Jan-19	--	11	<11	--	--	--

Remark:
1. LOR denotes limit of reporting.
2. The collected sample volume of the gas bag is sufficient for olfactometry analysis.
3. Field Blank containing pure nitrogen gas was collected and filled by ALS staff.
4. The volumetric flow rate value for calculation of the emission rate was provided by the client.

APPENDIX 1

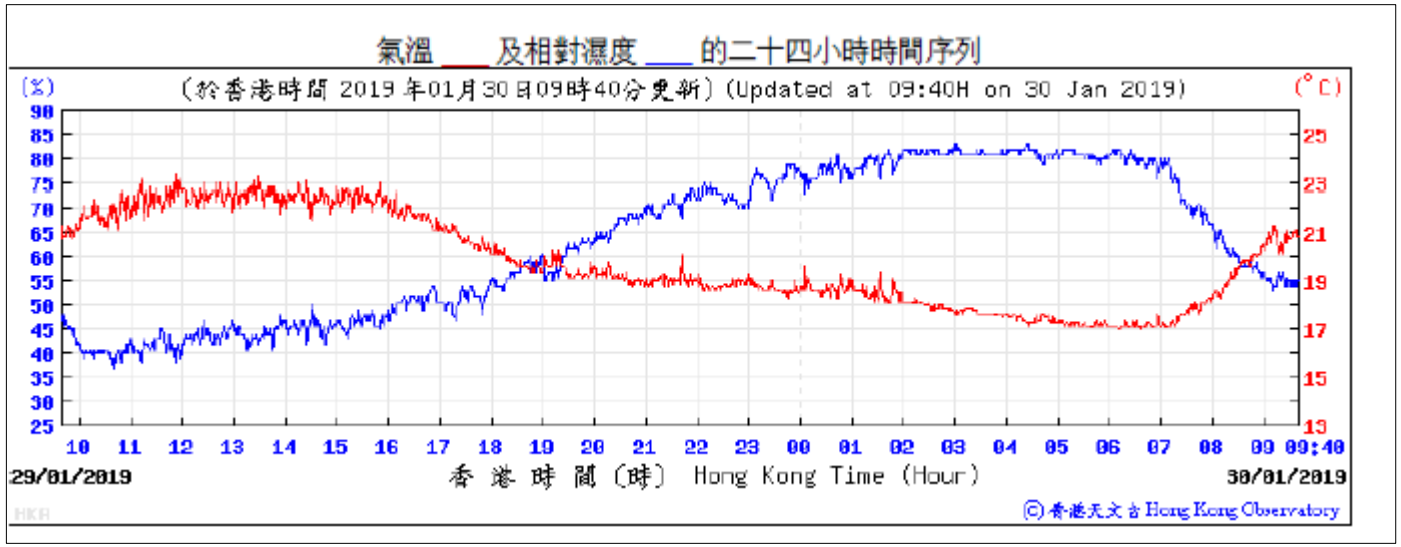
A1. SITE CONDITIONS AND OBSERVATION

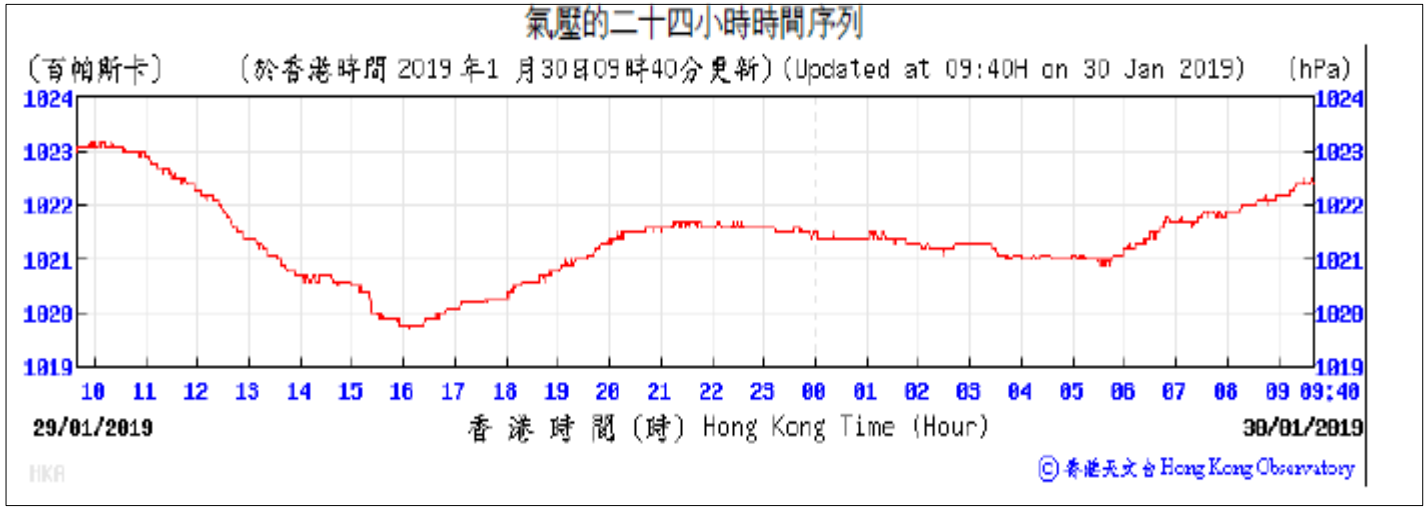
Location	Date	Time	Ambient Temperature (°C)	Relative Humidity (%)	Ambient Pressure (hPa)	Wind Speed (m/s)	Wind Direction (Degree)	Direction from Source[1]	Duration of Odour	On-Site Observation		Weather Condition
										Odour Nature	Possible Source	
CAPC Unit	29-1-19	14:00 - 14:08	19.8	65.5	1018.6	4.8	328	NA	NA	No odour was smelled.	NA	Sunny

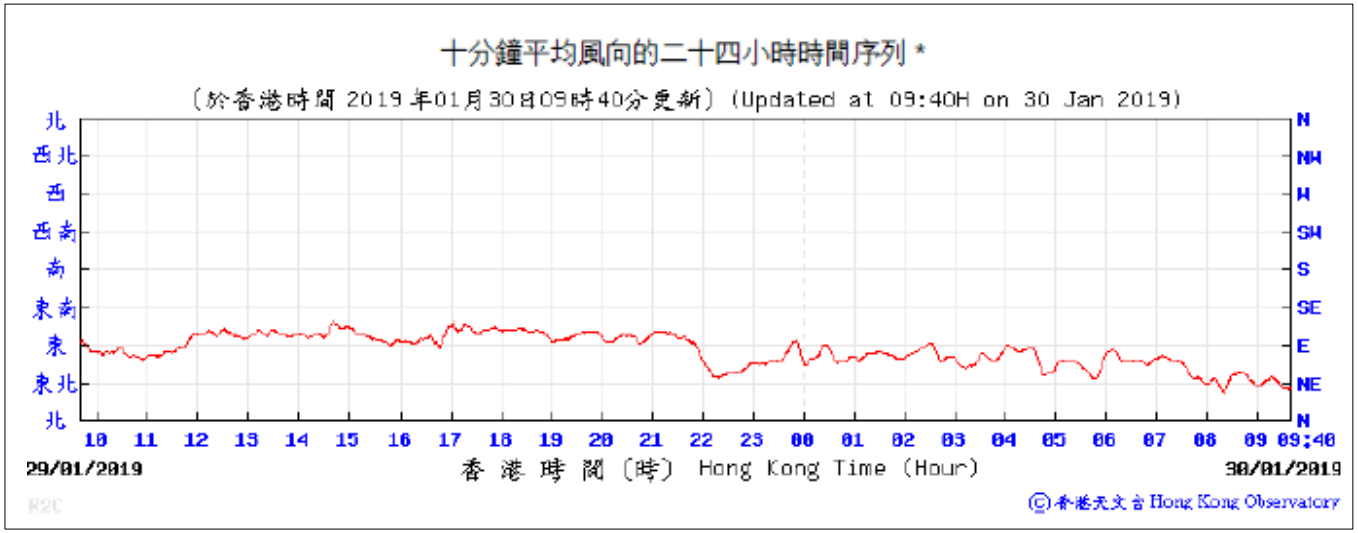
Note:
1. It was assumed that the exhaust of the CAPC Unit was from the odour source.

APPENDIX 2

A2. EXTRACT OF METEOROLOGICAL OBSERVATIONS FROM THE HONG KONG AIRPORT OBSERVATORY STATION



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(於香港時間 2019 年01月30日09時40分更新) (Updated at 09:40H on 30 Jan 2019)
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西南
南
東南
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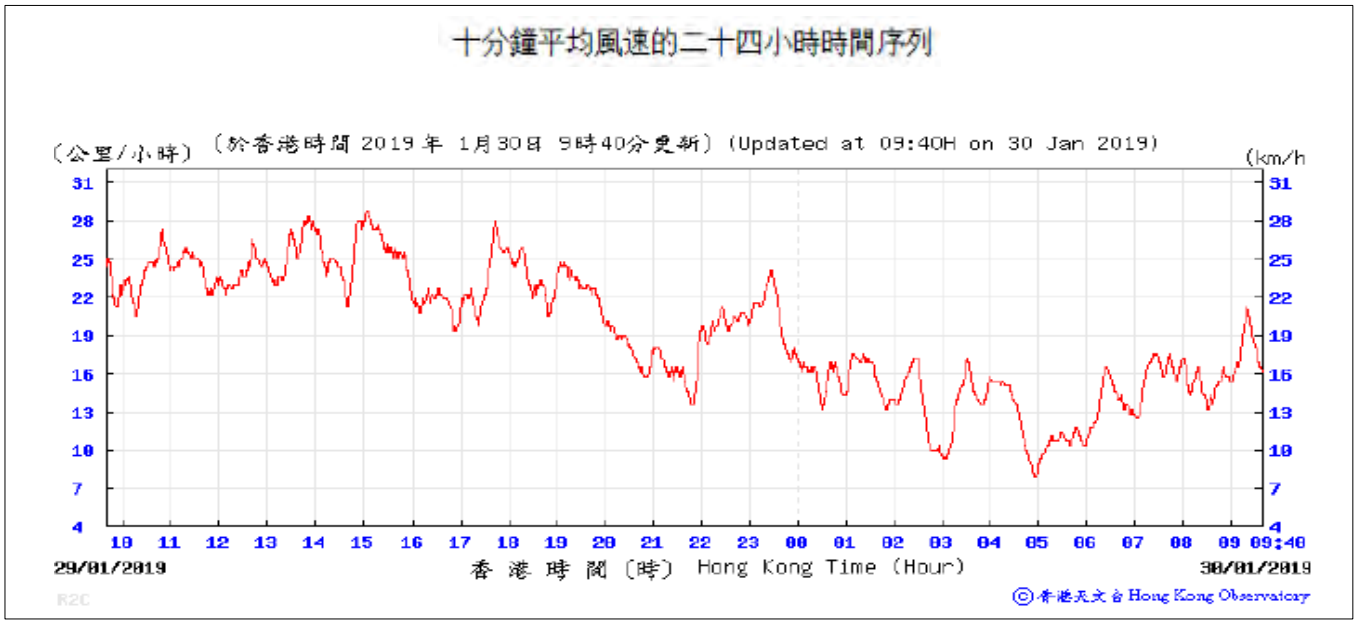
29/01/2019
香 港 時 間 (時) Hong Kong Time (Hour)
30/01/2019
©香港天文台 Hong Kong Observatory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(km/h)
31
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22
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29/01/2019
香 港 時 間 (時) Hong Kong Time (Hour)
30/01/2019
©香港天文台 Hong Kong Observatory

APPENDIX 3

A3. PHOTO OF THE SAMPLING LOCATION

ALS Technichem (HK) Pty Ltd
T1/F, Chung Shun Knitting Centre
1-3 Wing Yip Street
Kwai Chung, N.T., Hong Kong
T +852 2610 1044 F +852 2610 2021

CERTIFICATE OF ANALYSIS

CLIENT:	Oscar Bioenergy Joint Venture	WORK ORDER:	HK1904548
CONTACT:	Mr Edwin Wong		
ADDRESS:	No. 5, Sham Fung Road, Siu Ho Wan, North Lantau Island, NT, Hong Kong	LABORATORY:	Hong Kong
		SUB-BATCH:	0
		DATE RECEIVED:	29 January 2019
		DATE OF ISSUE:	13 February 2019
PROJECT:	Odour Monitoring for the Organic Resources Recovery Centre Phase 1 in Siu Ho Wan	SAMPLE TYPE:	Air
SITE:	Organic Resources Recovery Centre Phase 1 (ORRC1)	NO OF SAMPLES:	3
PO:	---		

COMMENTS

Air sample(s) were collected by ALS Technichem (HK) staff on 29th January, 2019 at the Organic Resources Recovery Centre Phase 1 (ORRC1) in Siu Ho Wan for Odour Monitoring.

The sample(s) were analysed and reported on an as received basis.

NOTES

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.

Richard Fung
General Manager - Hong Kong

METHOD STATEMENT

A. Odour Concentration

1. Odour Sampling

Odour gas sample was collected by passive sampling technique. A Nalophan™ sampling bag was placed inside an air-tight sampler and then drawn to vacuum. Approximately 60 litre of gas sample was collected into the sampling bag for testing.

The odour sample was collected at the Organic Recovery Resources Centre Phase 1 (ORRC1) and sampling location was shown in Appendix A2.

2. Olfactometry Testing

Odour concentration was determined by a Forced-choice Dynamic Olfactometer in accordance with the European Standard Method (EN13725).

This European Standard specifies a method for the objective determination of the odour concentration of a gaseous sample using dynamic olfactometry with human assessors and the emission rate of odours emanating from point sources, area sources with outward flow and area sources without outward flow.

This European Standard is applicable to the measurement of odour concentration of pure substances, defined mixtures and undefined mixtures of gaseous odorants in air or nitrogen, using dynamic olfactometry with a panel of human assessors being the sensor.

The unit of measurement is the odour unit per cubic metre: OU_E/m^3. The odour concentration is measured by determining the dilution factor required to reach the detection threshold. The odour concentration at the detection threshold is by definition 1 OU_E/m^3. The odour concentration is then expressed in terms of multiples of the detection threshold. The range of measurement including pre-dilution prior to the olfactometry analysis is typically from 10^1 ou_E/m^3 to 10^7 ou_E/m^3.

Olfactometry Testing was performed by using the Scentroid™ SS600 Olfactometer. The testing was performed by at least five qualified panellists who have been selected through an n-butanol screening test.

All testing finished within 24 hours after sample receipt.

RESULT

Odour Concentration

Sample ID	Location	Sampling Date	Sampling Time	LOR (ou_E/Nm^3)	Odour Concentration (ou_E/Nm^3)	Characteristics of the odour detected of the gas sample	Volumetric Flow Rate (Nm^3/min)	Emission rate (ou_E/hr)
HK1904548-001	CAPC	29-Jan-19	15:03 - 15:07	11	93	Garbage smell with minor fishy smell	1961.5	10,900,000
HK1904548-002	CAPC	29-Jan-19	15:07 - 15:11	11	154	Garbage smell with minor fishy smell	1961.5	18,100,000
HK1904548-003	Field Blank	29-Jan-19	--	11	<11	--	--	--

Remark:
1. LOR denotes limit of reporting.
2. The collected sample volume of the gas bag is sufficient for olfactometry analysis.
3. Field Blank containing pure nitrogen gas was collected and filled by ALS staff.
4. The volumetric flow rate value for calculation of the emission rate was provided by the client.

APPENDIX 1

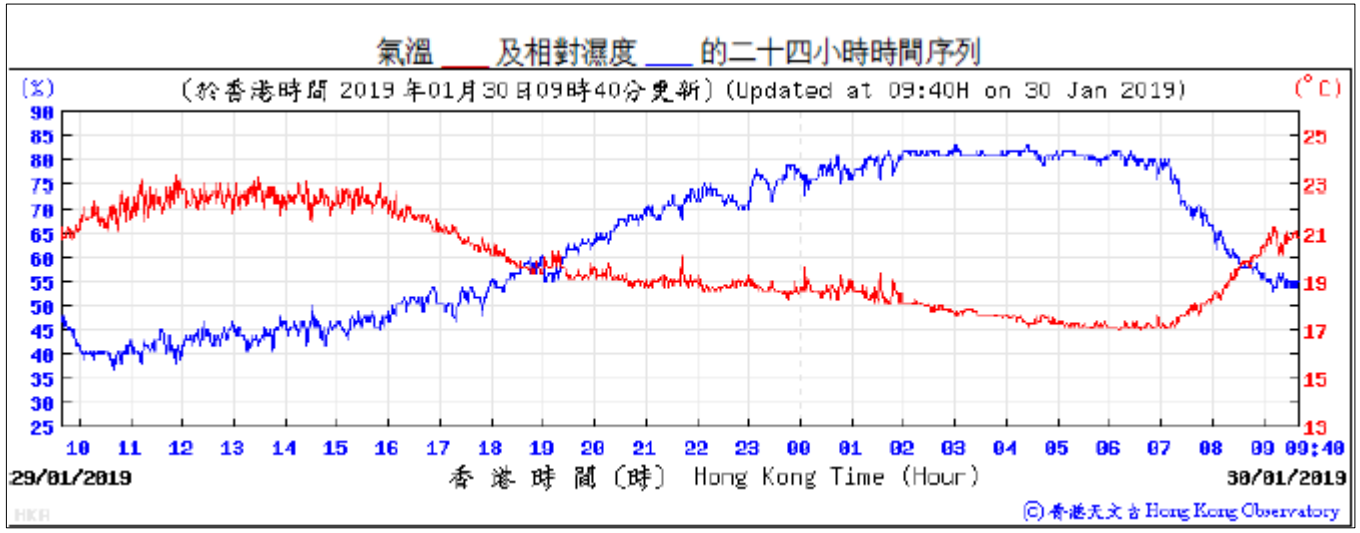
A1. SITE CONDITIONS AND OBSERVATION

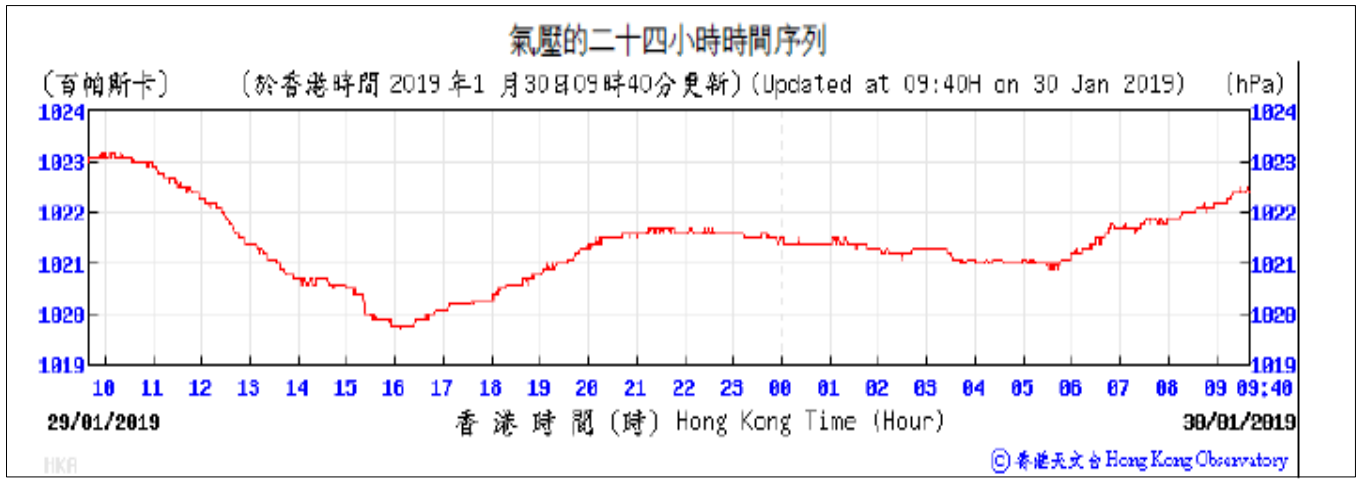
Location	Date	Time	Ambient Temperature (°C)	Relative Humidity (%)	Ambient Pressure (hPa)	Wind Speed (m/s)	Wind Direction (Degree)	Direction from Source[1]	Duration of Odour	On-Site Observation		Weather Condition
										Odour Nature	Possible Source	
CAPC Unit	29-1-19	15:03 - 15:11	19.9	66.5	1018.5	3.3	314	NA	NA	No odour was smelled.	NA	Sunny

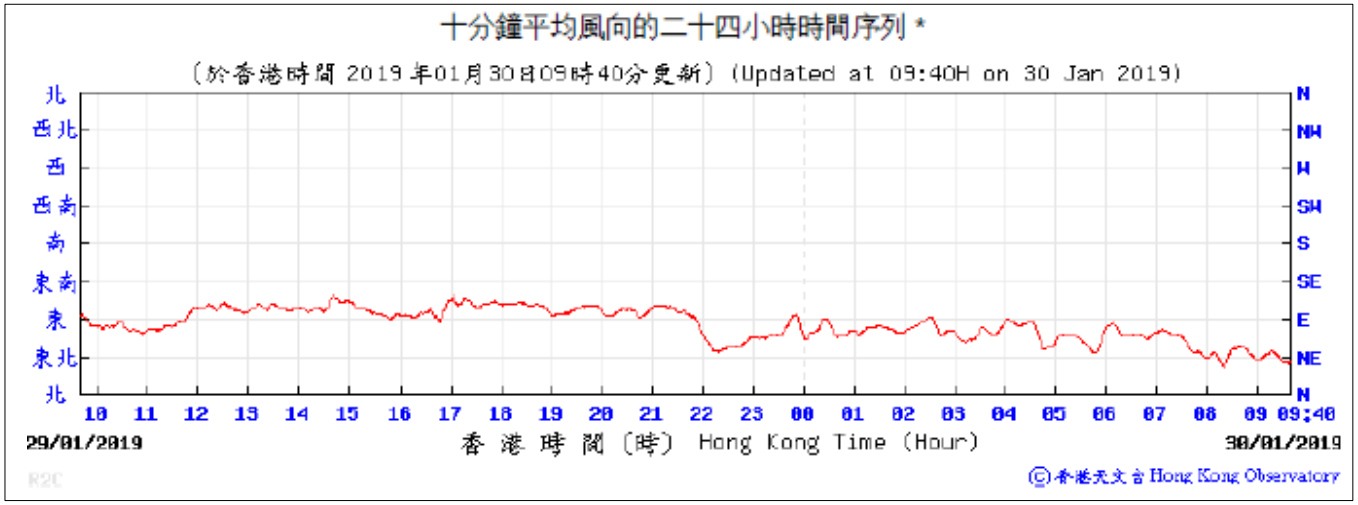
Note:
1. It was assumed that the exhaust of the CAPC Unit was from the odour source.

APPENDIX 2

A2. EXTRACT OF METEOROLOGICAL OBSERVATIONS FROM THE HONG KONG AIRPORT OBSERVATORY STATION






十分鐘平均風向的二十四小時時間序列 *
(於香港時間 2019 年01月30日09時40分更新) (Updated at 09:40H on 30 Jan 2019)
北
西北
西
西南
南
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東
東北
北
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10 11 12 13 14 15 16 17 18 19 20 21 22 23 00 01 02 03 04 05 06 07 08 09 09:40
29/01/2019
香 港 時 間 (時) Hong Kong Time (Hour)
30/01/2019
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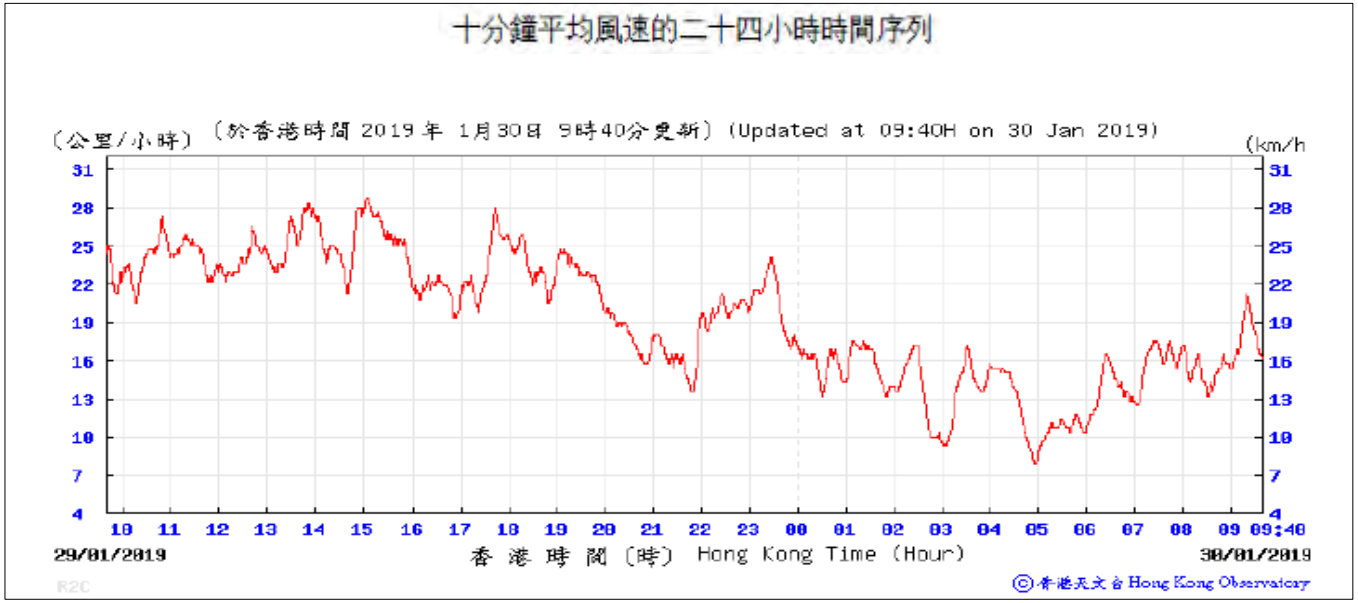
十分鐘平均風速的二十四小時時間序列
(公里/小時) (於香港時間 2019 年 1月30日 9時40分更新) (Updated at 09:40H on 30 Jan 2019)
(km/h)
31
28
25
22
19
16
13
10
7
4
10 11 12 13 14 15 16 17 18 19 20 21 22 23 00 01 02 03 04 05 06 07 08 09 09:40
29/01/2019
香 港 時 間 (時) Hong Kong Time (Hour)
30/01/2019
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APPENDIX 3

A3. PHOTO OF THE SAMPLING LOCATION

Annex H4

Action and Limit Levels for Odour Nuisance

Odour Intensity Level

Level	Odour Intensity
0	Not detected. No odour perceived or an odour so weak that it cannot be easily
1	Slight identifiable odour, and slight chance to have odour
2	Moderate identifiable odour, and moderate chance to have odour
3	Strong identifiable, likely to have odour nuisance
4	Extreme severe odour, and unacceptable odour level

Action and Limit Levels for Odour Nuisance

Parameter	Action Level	Limit Level
Odour Nuisance (from odour patrol)	When one documented compliant is received(1), or Odour Intensity of 2 is measured from odour patrol.	Two or more documented complaints are received(1) within a week; or Odour intensity of 3 or above is measured from odour patrol.

Note:

(1) Once the compliant is received by the Project Proponent (EPD), the Project Proponent would investigate and verify the complaint whether it is related to the potential odour emission from the OWTF and its on-site wastewater treatment unit.

Event and Action Plan for Odour Monitoring

EVENT	ACTION	
	Person-in-charge of Odour	**Project Proponent**[1]
ACTION LEVEL		
Exceedance of action level (Odour Patrol)	1. Identify source/reason of exceedance; 2. Repeat odour patrol to confirm finding.	1. Carry out investigation to identify the source/reason of exceedance. Investigation should be completed within 2 weeks; 2. Rectify any unacceptable practice; 3. Implement more mitigation measures if necessary; 4. Inform DSD or the operator of the Siu Ho Wan Sewage Treatment Works (SHWSTW) if exceedance is considered to be caused by the operation of the SHWSTW. 5. Inform North Lantau Refuse Transfer Station (NLTS) operator if exceedance is considered to be caused by the operation of NLTS.

EVENT	ACTION	
	Person-in-charge of Odour	**Project Proponent**[(1)]
Exceedance of action level (Odour Complaints)	1. Identify source/reason of exceedance; 2. Carry out odour patrol to determinate odour intensity.	1. Carry out investigation and verify the complaint whether it is related to potential odour emission from the nearby SHWSTW; 2. Carry out investigation to identify the source/reason of exceedance. Investigation should be completed within 2 weeks; 3. Rectify any unacceptable practice; 4. Implement more mitigation measures if necessary; 5. Inform DSD or the operator of the SHWSTW if exceedance is considered to be caused by the operation of the SHWSTW.

EVENT	ACTION	
	Person-in-charge of Odour	**Project Proponent**(1)
LIMIT LEVEL		
Exceedance of Limit level	1. Identify source/reason of exceedance; 2. Inform EPD; 3. Repeat odour patrol to confirm findings; 4. Increase odour patrol frequency to bi-weekly; 5. Assess effectiveness of remedial action and keep EPD informed of the results; 6. If exceedance stops, cease additional odour patrol.	1. Carry out investigation to identify the source/reason of exceedance. Investigation should be completed within 2 week; 2. Rectify any unacceptable practice; 3. Formulate remedial actions; 4. Ensure remedial actions properly implemented; 5. If exceedance continues, consider what more/enhanced mitigation measures should be implemented;

Note: (1) Project Proponent shall identify an implementation agent

Annex I

Investigation Report

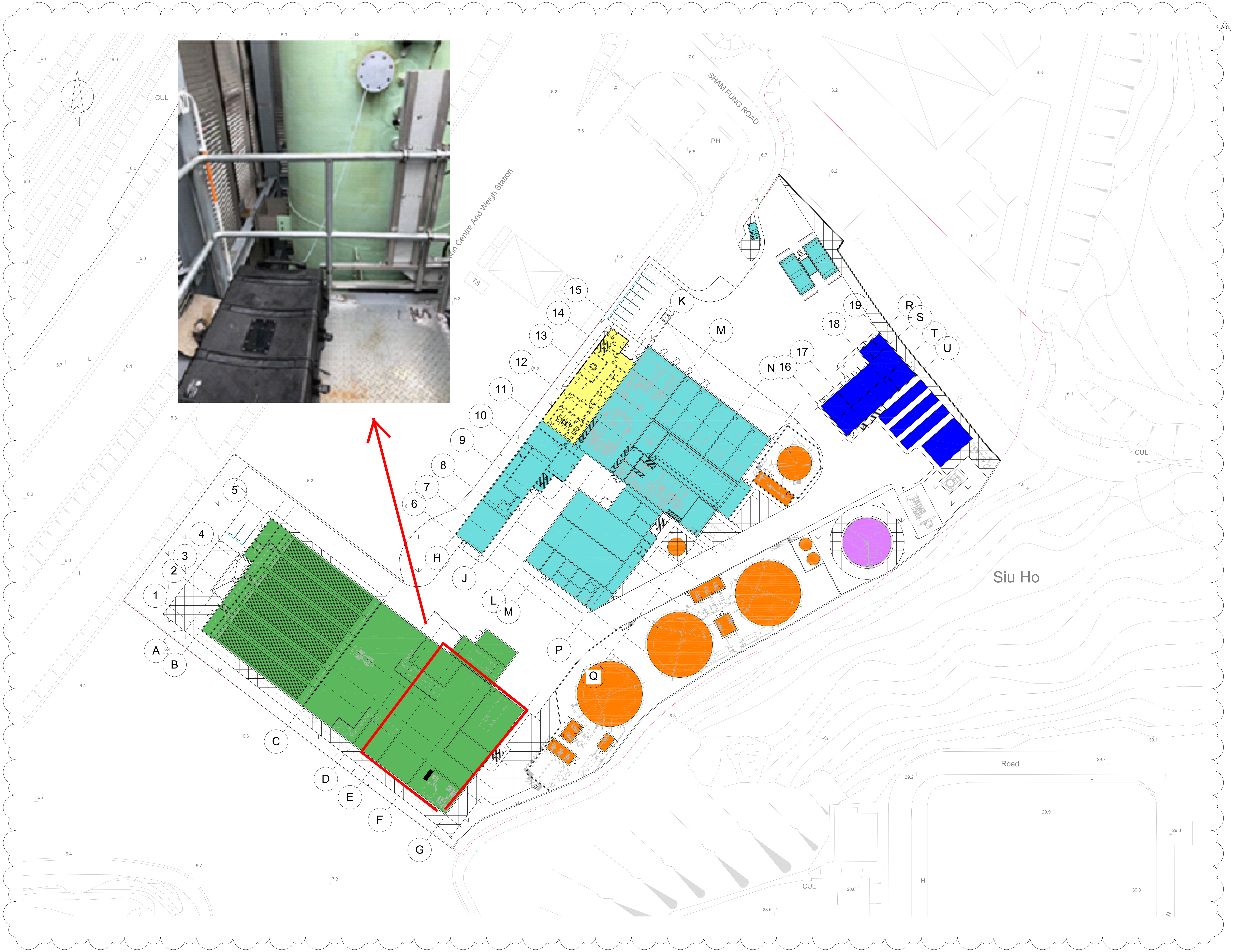
Investigation Report of Odour Sampling Exceedances

Date	10, 11, 19 and 27 December 2018; 16 January 2019
Time	Sampling times were shown in **Appendix B.**
Monitoring Location	Centralized Air Pollution Control System (CAPCS) ((Detailed location and photos shown on the marked drawing DR-OAP-20-0-CA-1001 attached as **Appendix A**)
Weather	Fine
Parameter	Odour
Exceedance Description	1. On 10, 11, 19 and 27 December 2018 and 16 and 29 January 2019, air samples were collected from the outlet of the CAPCS by ALS for measurement of the odour concentration (in term of Odour Unit (OU) by olfactometry analysis at the laboratory. The EM&A Manual, has set an odour limit of 220 OU/Nm^3 for the CAPCS stack. The odour concentrations of the odour samples collected from the CAPCS on 10, 11, 19 and 27 December 2018; 16 January 2019 have exceeded the odour limits. The odour analysis results are shown in **Appendix B**. 2. According to the Contractor, the plant was operated normally. Odour emitting activities, including waste reception and pretreatment process, AD process, wastewater treatment plant, sludge dewatering and composting process were operating on the sampling days. The CAPCS was operating during the odour sampling periods. 3. The plant received an average of 100 tonnes of SSOW daily in the reporting period. 4. The Contractor reported that the chemical dosing system of the CAPCS have some problems resulting in a high concentration of odorous gases H_2S and NH_3 in the exhaust air, which led to exceedances of the odour limit. In addition, the Contractor reported that the prepared of the chemical dosing system took longer than anticipated resulting in a prolonged exceedances recorded during December 2018.
Action Taken / Action to be Taken	Once it was identified that there was a problem with the chemical dosing system, the Contractor added the chemical to the system manually to minimise the exceedences. The Contractor has also contacted the supplier of the chemical dosing system to carry out repairing work so that the system can function properly.
Remedial Works and Follow-up Actions	The Contractor is recommended to closely monitor the operation of the chemical dosing system to avoid the reoccurrence of similar problem. The system is fixed and the odour concentration of the air sample taken on 29 January 2019 showed compliance with the odour limit.

Prepared by:	Bonia Leung, ET Representatives
Date	09-Apr-2019

Appendix A

Monitoring Location



REV	DATE	BY	APP	DESCRIPTION
A01	05/03/15	CW	MB	IMTECH BACKGROUNDS UPDATED
A00	18/02/15	CW	MB	DRAFT ISSUE

CLIENT
ENVIRONMENTAL PROTECTION DEPARTMENT
GOVERNMENT OF THE HKSAR

CLIENT'S CONSULTANT
AECOM
AECOM ASIA CO. LTD.

CONTRACTOR
suez SITA ATAL RosRoca
OSCAR BIOENERGY JV

LEAD DESIGNER
ARUP
Ove Arup & Partners Hong Kong Limited

ENVIRONMENTAL TEAM
ERM
ERM HONG KONG LIMITED

INDEPENDENT CONSULTANTS
MEINHARDT
Meinhardt Infrastructure and Environment Limited
邁進基建環保工程顧問有限公司

PROJECT
ORGANIC WASTE TREATMENT FACILITIES
PHASE 1
EP/SP/61/10

STATUS
DRAFT ISSUE

DRAWING TITLE
SITE LAYOUT

DRAWN	CHECKED	APPROVED
CW	RS	DP

SCALE	DATE
1:500@A1 / 1:1000@A3	12/02/15

JOB NO.	DRAWING NO.	REV.
239956	DR-OAP-20-0-CA-1001	A01

Appendix B

Odour Sampling Results Summary

Sampling Date	Sampling Time	Odour Concentration (OU /Nm^3)[Note]
10 Dec 2018	11:36-11:41	828
10 Dec 2018	11:41-11:46	886
10 Dec 2018	11:56-12:02	773
10 Dec 2018	12:02-12:07	674
11 Dec 2018	15:13-15:17	476
11 Dec 2018	15:19-15:23	510
11 Dec 2018	15:34-15:38	414
11 Dec 2018	15:38-15:43	443
19 Dec 2018	15:08-15:12	1164
19 Dec 2018	15:29-15:33	1016
27 Dec 2018	14:07-14:10	1026
27 Dec 2018	14:11-14:14	1026
27 Dec 2018	14:45-14:48	1087
27 Dec 2018	14:49-14:53	1087
16 Jan 2019	13:42-13:45	444
16 Jan 2019	13:48-13:52	476
16 Jan 2019	15:54-15:57	546
16 Jan 2019	15:58-16:02	509
29 Jan 2019	14:00-14:04	116
29 Jan 2019	14:04-14:08	93
29 Jan 2019	15:03-15:07	93
29 Jan 2019	15:03-15:07	154

Note: According to the EM&A Manual and EP requirements, it is considered an exceedance if the odour level is more than 220 OU/Nm^3.