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

Thirty-ninth Quarterly EM&A Summary Report

PREPARED FOR
OSCAR Bioenergy Joint Venture

DATE
11 December 2025

REFERENCE
0279222

Meinhardt Infrastructure and Environment Limited

Organic Resources Recovery Centre, Phase I

39th Quarterly EM&A Report

(1 Dec 2024 – 28 Feb 2025)

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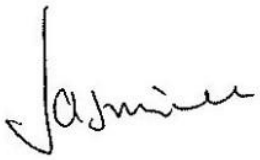

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EXECUTIVE SUMMARY

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 39th Quarterly Environmental Monitoring and Audit (EM&A) report presenting the EM&A works carried out during the period from 1 December 2024 to 28 February 2025 in accordance with the EM&A Manual.

ENVIRONMENTAL MONITORING AND AUDIT PROGRESS

AIR QUALITY MONITORING

Non-compliance of emission limits of Dust and Total Odour from CAPCS; NO_x and SO_2 from CHP1; NO_x from CHP2; NO_x and HCl from CHP3; and NO_x, SO_2, and NH_3 from the ASP were recorded during December 2024.

Non-compliance of emission limits of Total Odour from CAPCS; NO_x and HCl from CHP1; NO_x and SO_2 from CHP2; NO_x from CHP3; and NO_x, SO_2, NH_3, and HCl from the ASP; and HF from the Standby Gas Flaring Unit were recorded during January 2025.

Non-compliance of emission limits of Total Odour from CAPCS; NO_x from CHP1; NO_x from CHP2; NO_x from CHP3; CO, NO_x, SO_2, NH_3, and HCl from the ASP were recorded during February 2025.

Exceedances occurred due to system instability, incorrect sensor readings and start-up issues.

ENVIRONMENTAL EXCEEDANCE/ NON-CONFORMANCE/ COMPLIANT/ SUMMONS AND PROSECUTION

Exceedances for the air emission limits for the CAPCS, CHP, ASP stacks, and Standby Gas Flaring Unit were recorded during the reporting period.

No complaint was received during the reporting period.

1. PROJECT INFORMATION

1.1 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.

ERM-Hong Kong, Ltd (ERM) has been appointed by OSCAR as the Environmental Team (ET) for the construction phase EM&A programme and the Monitoring Team (MT) for the operation phase EM&A programme for the implementation of the EM&A programme in accordance with the requirements of the EP and the approved EM&A Manual.

1.2 GENERAL SITE DESCRIPTION

The Project Site is located at Siu Ho Wan in North Lantau with an area of about 2 hectares. The facility received an average of 140.38 to 153.95 tonnes and treated an average of 99.5 to 113.48 tonnes of source separated organic waste per day during the reporting period.

1.2.1 MAJOR ACTIVITIES UNDERTAKEN

A summary of the major activities undertaken in the reporting period is shown in *Table 1.1.*

TABLE 1.1 SUMMARY OF ACTIVITIES UNDERTAKEN IN THE REPORTING PERIOD

Activities Undertaken in the Reporting Period
• Operation of the Project, including organic waste reception, and operation of the pre treatment facilities, anaerobic digesters, composting facilities, air pollution control systems, on-line emission monitoring system for the Centralised Air Pollution Control Unit (CAPCS), Co-generation Units (CHP)s and Ammonia Stripping Plant (ASP), and the wastewater treatment plant; and • Cleaning of the ASP.

2. ENVIRONMENTAL MONITORING AND AUDIT REQUIREMENTS AND RESULTS

2.1 ENVIRONMENTAL MONITORING

2.1.1 AIR QUALITY

The concentrations of concerned air pollutants emitted from the stacks of the CAPCS, CHP, ASP and Standby Flaring Gas Unit during the reporting period are monitored on-line by the continuous environmental monitoring system (CEMS). The number of exceedances of the concerned air emissions monitored for the CAPCS, CHP, ASP and Standby Flaring Gas Unit during this reporting period are presented in *Tables 2.1* to *2.6*.

It should be noted that measurements recorded under abnormal operating conditions, e.g., start up and stopping of stacks and unstable operation, as well as test runs and interference of sensor, are disregarded.

TABLE 2.1 HOURLY AVERAGE OF PARAMETERS RECORDED FOR CAPCS

Parameter	Range of Hourly Average Conc. (mg/Nm^3)	Emission Limit (mg/Nm^3)	Exceedance Identified	Remarks
VOCs (including methane) [(a)]	0 – 202	680	Nil	System unstable (e.g., low efficiency)
Dust (or TSP)	0 – 491	6	Identified [(c)]	System unstable (e.g., low efficiency)
Odour (including NH_3 & H_2S) [(b)]	0 – 2,056	220	Identified [(d)]	System unstable (e.g., low efficiency)

Notes:
(a) The VOCs emission limit includes methane as biogas is adopted, as fuel in the combustion process.
(b) The odour unit is OU/Nm^3.
(c) Dates with Dust exceedances (number of exceedances on that day) were identified on 2(12) and 17(2) December 2024.
(d) Dates with Odour exceedances (number of exceedances on that day) were identified on 1(24), 2(19), 3(24), 4(24), 5(24), 6(4), 7(5), 8(7), 9(6), 10(7), 11(13), 12(16), 13(13), 14(3), 15(13), 16(16), 17(13), 18(13), 19(7), 20(1), 21(4), 23(2), 24(4), 26(6), 27(3), and 31(13) December 2024; 1(2), 2(11), 3(9), 4(4), 6(2), and 7(2) January 2025; and 17(5) February 2025.

TABLE 2.2 HOURLY AVERAGE OF PARAMETERS RECORDED FOR CHP 1

Parameter	Range of Hourly Average Conc. (mg/Nm^3) [(a)]	Max. Emission Limit (mg/Nm^3)	Exceedance Identified	Remarks
Dust (or TSP)	0 - 14	15	Nil	Nil
Carbon Monoxide	0 - 648	650	Nil	Nil
NO_x	0 – 587	300	Identified [(c)]	System unstable (e.g., low efficiency)
SO_2	0 – 67	50	Identified [(d)]	System unstable (e.g., low efficiency)
VOCs (including methane) [(b)]	0 – 686	1,500	Nil	Nil
HCl	0 - 24	10	Identified [(e)]	System unstable (e.g., low efficiency)
HF	0 - 1	1	Nil	Nil

Notes:
(a) All values refer to an oxygen content in the exhaust gas of 6% and dry basis.
(b) The VOCs emission limit includes methane as biogas is adopted as fuel in the combustion process.
(c) Dates with NO_x exceedances (number of exceedances on that day) were identified on 1(24), 2(24), 3(24), 4(19), 5(5), 6(2), 10(2), 11(5), 12(14), 13(24), 14(24), 15(24), 16(16), 17(24), 18(24), 19(24), 20(24), 21(24), 22(24), 23(24), 24(24), 25(11), 28(2), 30(2), and 31(1) December 2024; 1(5), 3(3), 4(7), 5(1), 6(2), 7(13), 8(14), 9(20), 12(2), 14(13), 15(17), 21(14), 22(2), 25(9), 26(22), 28(12) and 29(12) January 2025; and 7(1), 14(3), 17(1), 25(13), 26(10) and 28(1) February 2025 .
(d) Dates with SO_2 exceedances (number of exceedances on that day) were identified on 12(2), 13(2), 14(13), 15(4), 16(7), and

Parameter	Range of Hourly Average Conc. (mg/Nm^3) [a]	Max. Emission Limit (mg/Nm^3)	Exceedance Identified	Remarks

17(3) December 2024.
(e) Date with HCl exceedance (number of exceedance on that day) was identified on 1(1) January 2025.

TABLE 2.3 HOURLY AVERAGE OF PARAMETERS RECORDED FOR CHP 2

Parameter	Range of Hourly Average Conc. (mg/Nm^3) [a]	Max. Emission Limit (mg/Nm^3)	Exceedance Identified	Remarks
Dust (or TSP)	0 – 15	15	Nil	Nil
Carbon Monoxide	0 – 649	650	Nil	Nil
NO_x	0 – 494	300	Identified [c]	System unstable (e.g., low efficiency)
SO_2	0 – 51	50	Identified [d]	System unstable (e.g., low efficiency)
VOCs (including methane) [b]	0 – 1,145	1,500	Nil	Nil
HCl	0 – 9	10	Nil	Nil
HF	0 – 1	1	Nil	Nil

Notes:
(a) All values refer to an oxygen content in the exhaust gas of 6% and dry basis.
(b) The VOCs emission limit includes methane as biogas is adopted as fuel in the combustion process.
(c) Dates with NO_x exceedances (number of exceedances on the day) were identified on 5(3), 6(5), 8(4), 9(16), 10(16), 11(14), and 13(14) December 2024; 6(1), 7(6), 8(12), 9(14), 10(11), 11(24), 12(13), 13(4), 14(10), 15(20), 16(24), 17(21), 19(13), 20(7), 21(1), 22(8), 27(5), 28(1), 29(2) and 31(8) January 2025; and 8(3), 10(6), 11(11), 15(1), 20(10), 21(7) and 22(1) February 2025.
(d) Date with SO_2 exceedance (number of exceedance on that day) was identified on 17(1) January 2025.

TABLE 2.4 HOURLY AVERAGE OF PARAMETERS RECORDED FOR CHP 3

Parameter	Range of Hourly Average Conc. (mg/Nm^3) [a]	Max. Emission Limit (mg/Nm^3)	Exceedances Identified	Remarks
Dust (or TSP)	0 – 5	15	Nil	Nil
Carbon Monoxide	0 – 127	650	Nil	Nil
NO_x	0 – 605	300	Identified [c]	System unstable (e.g., low efficiency)
SO_2	0 – 37	50	Nil	Nil
VOCs (including methane) [b]	0 – 1,113	1,500	Nil	Nil
HCl	0 – 41	10	Identified [e]	System unstable (e.g., low efficiency)
HF	0 – 1	1	Nil	Nil

Notes:
(a) All values refer to an oxygen content in the exhaust gas of 6% and dry basis.
(b) The VOCs emission limit includes methane as biogas is adopted as fuel in the combustion process.
(c) Dates with NO_x exceedances (number of exceedances on the day) were identified on 1(3), 2(2), 3(1), 4(2), 5(7), 6(14), 7(7), 8(7), 10(2), 11(6), 12(5), 16(12), 17(1), 18(4), 19(7), 20(14), 21(5), 23(3), 24(3), 26(2), 27(11), 28(1), 29(9), 30(4), and 31(4) December 2024; 1(10), 2(15), 3(7), 4(15), 5(3), 6(1), 7(6), 10(13), 11(7), 12(22), 13(16), 14(6), 15(1), 16(4), 17(10), 18(4), 20(10), 21(7), 23(2), 24(9), 25(2), 26(13), 27(10), 28(2), 29(7), 30(1) and 31(9) January 2025; and 1(8), 4(4), 5(3), 8(1), 12(5), 13(11), 14(3), 16(2), 19(2), 20(4), 22(5), 23(9) and 24(3) February 2025.
(d) Date with HCl exceedance (number of exceedance on that day) was identified on 23(1) December 2024.

TABLE 2.5 HOURLY AVERAGE OF PARAMETERS RECORDED FOR ASP

Parameter	Range of Hourly Average Conc. (mg/Nm^3) [a]	Max. Emission Limit (mg/Nm^3)	Exceedances Identified	Remarks
Dust (or TSP)	0 – 5	5	Nil	Nil
Carbon Monoxide	0 – 207	100	Identified [c]	Incorrect sensor(s) reading
NO_x	0 – 2,773	200	Identified [d]	System unstable (e.g., low efficiency)
SO_2	0 – 233	50	Identified [e]	System unstable (e.g., low efficiency)
VOCs (including methane) [b]	0 – 20	20	Nil	Nil
NH_3	0 – 353	35	Identified [f]	System unstable (e.g., low efficiency)
HCl	0 – 15	10	Identified [g]	System unstable (e.g., low efficiency)
HF	0 – 1	1	Nil	Nil

Parameter	Range of Hourly Average Conc. (mg/Nm^3) [(a)]	Max. Emission Limit (mg/Nm^3)	Exceedances Identified	Remarks

Notes:
(a) All values refer to an oxygen content in the exhaust gas of 11% and dry basis.
(b) The VOCs emission limit include methane as biogas is adopted as fuel in the combustion process.
(c) Date with Carbon Monoxide exceedance (number of exceedance on the day) was identified on 28(1) February 2025.
(d) Dates with NO_x exceedances (number of exceedances on the day) were identified on 1(23), 2(23), 3(22), 4(23), 5(20), 6(24), 7(20), 8(24), 9(9), 10(17), 11(23), 12(23), 13(21), 14(20), 15(24), 16(22), 17(23), 18(23), 19(24), 20(17), 21(18), 22(17), 23(18), 24(24), 25(24), 26(23), 27(6), 28(20), 29(23), 30(11), and 31(16) December 2024; 1(18), 2(12), 3(24), 4(18), 5(19), 6(18), 7(12), 8(16), 9(21), 10(19), 11(23), 12(15), 13(19), 14(20), 15(20), 16(21), 17(23), 18(8), 19(13), 20(24), 21(9), 22(12), 23(2), 24(13), 25(24), 26(21), 27(20), 28(10) January 2025; and 1(17), 2(21), 3(13), 4(16), 5(20), 6(24), 7(20), 8(24), 9(24), 10(24), 11(21), 12(24), 13(24), 14(18), 15(4), 16(11), 17(15), 18(19), 19(20), 20(5), 21(14), 22(21), 23(18), 24(20), 25(10), 26(8), 27(15) and 28(10) February 2025.
(e) Dates with SO_2 exceedances (number of exceedances on the day) were identified on 1(24), 2(22), 3(18), 4(21), 5(21), 6(24), 7(23), 8(24), 9(9), 10(17), 11(22), 12(23), 13(21), 14(22), 15(24), 16(22), 17(23), 18(17), and 19(10) December 2024; 1(1), 6(1), 10(2), 11(5), 12(1), 13(4), 15(4), 16(21), 17(22), 18(8), 19(13), 20(6) and 26(1) January 2025; and 5(1), 21(1) 23(1), and 24(1) February 2025.
(f) Dates with NH_3 exceedances (number of exceedances on the day) were identified on 1(5), 2(7), 3(7), 4(9), 5(3), 6(2), 7(2), 8(6), 9(3), 10(9), 11(12), 12(3), 13(2), 14(5), 15(1), 16(2), 18(10), 20(4), 21(12), 22(9), 23(6), 24(3), 26(4), 27(3), 28(5), 29(3), and 31(2) December 2024; 1(2), 5(9), 6(11), 7(2), 9(5), 10(9), 11(8), 12(2), 13(6), 14(1), 16(2), 17(1), 18(2), 20(4), 21(1), 22(1), 23(2), 24(6) and 26(6) January 2025; and 1(5), 2(2), 3(1), 4(3), 5(1), 15(1), 19(1), 21(6), 22(16), 23(11), 24(3), 25(1), 26(2), 27(5) and 28(4) February 2025.
(g) Dates with HCl exceedances (number of exceedance on the day) were identified on 26(1) January 2025 and 24(1) February 2025.

TABLE 2.6 HOURLY AVERAGE OF PARAMETERS RECORDED FOR THE STANDBY FLARING GAS UNIT

Parameter	Range of Hourly Average Conc. (mg/Nm^3) [(a)]	Max. Emission Limit (mg/Nm^3)	Exceedances Identified	Remarks
Dust (or TSP)	0 – 0	5	Nil	Nil
Carbon Monoxide	0 – 9	100	Nil	Nil
NOx	0 – 1	200	Nil	Nil
SO_2	0 – 2	50	Nil	Nil
VOCs (including methane) [(b)]	0 – 19	20	Nil	Nil
HCl	0 – 0	10	Nil	Nil
HF	0 – 3	1	Identified [(c)]	Start-up issues (not at working temperature)

Notes:
(a) All values refer to an oxygen content in the exhaust gas of 11% and dry basis.
(b) The VOCs emission limit include methane as biogas is adopted as fuel in the combustion process.
(c) Date with HF exceedance (number of exceedance on that day) was identified on 15(1) January 2025.

2.1.2 ODOUR

No monthly odour patrol was required to be conducted for this reporting period.

2.2 SITE AUDIT

Environmental mitigation measures (related to air quality, water quality, waste, land contamination, hazard-to-life, and landscape and visual) to be implemented during the operation phase of the Project are recommended in the approved EIA Report and EM&A Manual. Monthly site audits for December 2024 to February 2025 have been carried out to check the implementation of these mitigation measures. Follow-up actions resulting from the site audits were generally taken as reported by the Contractor. The Contractor has implemented environmental mitigation measures recommended in the approved EIA Report and EM&A Manual.

2.3 LANDSCAPE AND VISUAL

The monthly inspections of the landscape and visual mitigation measures for the operation phase of the Project were performed on 17 December 2024, 24 January 2025 and 21 February 2025, and no non-compliance in relation to the landscape and visual mitigation measures were identified.

2.4 WASTE MANAGEMENT

Wastes generated from the operation of the Project include chemical waste, wastes generated from pre-treatment process and general refuse. The quantities of different types of waste

generated from the operation of the Project in the reporting period are summarised in *Table 2.7.*

TABLE 2.7 QUANTITIES OF WASTE GENERATED FROM THE OPERATION OF THE PROJECT

Month / Year	Chemical Waste	Waste Generated from Pre-treatment Process		General Refuse	
	Disposal of at CWTC	Disposed of at Landfill [a]	Recycled [b]	Disposed of at Landfill [a] [e]	Recycled [c]
December 2024	1,020 L [d]	1,246.81 tonnes	0 tonnes	2.765 tonnes [e]	0.045 tonnes
January 2025	0 L [d]	1,267.22 tonnes	0 tonnes	2.650 tonnes [e]	0.055 tonnes
February 2025	2,297 L [d]	1,143.59 tonnes	0 tonnes	2.765 tonnes [e]	0.039 tonnes

Notes:

(a) Waste generated from pre-treatment process and general refuse other than chemical waste and recyclables were disposed of at NENT landfill by sub-contractors.

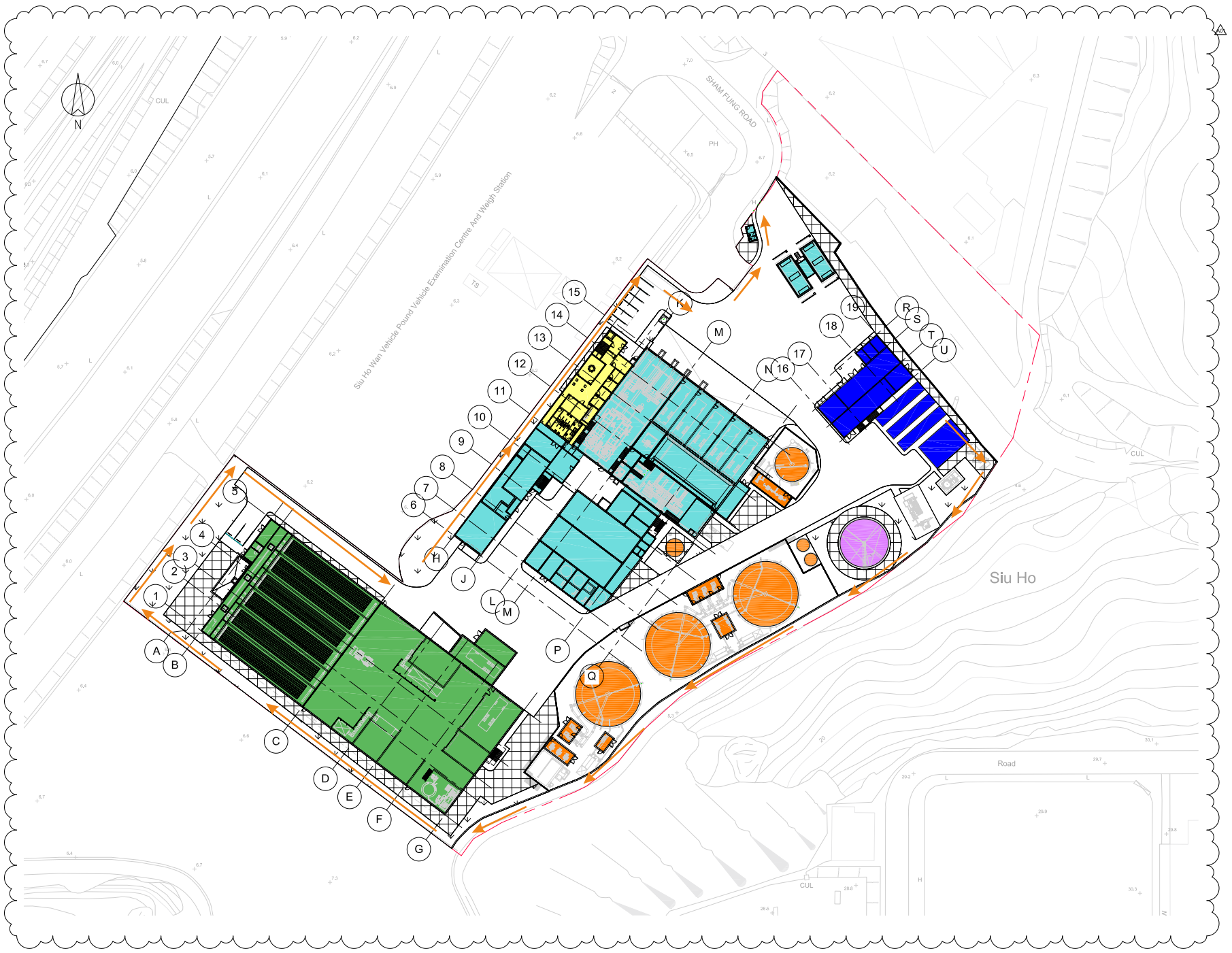
(b) Among waste generated from pre-treatment process, no metals, papers/ cardboard packing or plastics were sent to recyclers for recycling during the reporting period.

(c) Among general refuse, 0 tonnes of metals, 0.112 tonnes of papers/ cardboard packing and 0.027 tonnes of plastics were sent to recyclers for recycling during the reporting period.

(d) 1,020 L of chemical waste (1,000 L of spent lube oil and 20 L of spent acid) were disposed of at CWTC in December 2024, no chemical waste was disposed of at CWTC in January 2025 and 3400 kg of chemical waste was disposed of at CWTC in February 2025, for unit consistency, it has been converted to litre based on 1.48 g/cm3 conversion factor.

(e) It was assumed that four 240-litre bins filled with 80% of general refuse were collected at each collection. The general refuse density was assumed to be around 0.15 kg/L.

ANNEX A PROJECT LAYOUT



Key

→ Patrol Route

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
滙techn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

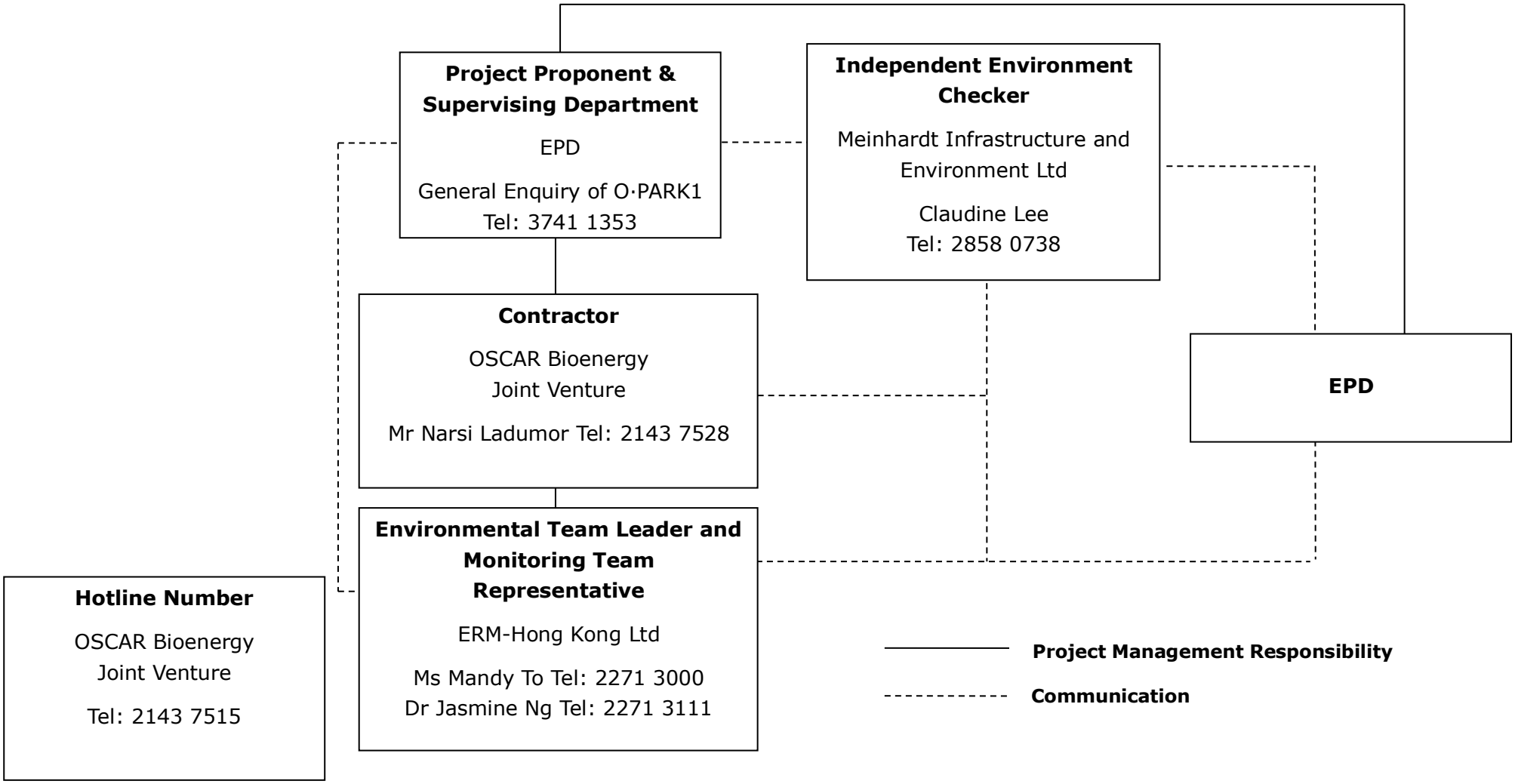
SCALE 1:500@A1 / 1:1000@A3

DATE 12/02/15

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

ANNEX B PROJECT ORGANISATION CHART AND CONTACT DETAIL

PROJECT ORGANISATION (WITH CONTACT DETAILS)



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