



ANNEX F

INVESTIGATION REPORT

Investigation Report of CEMS Exceedances	
Date	1 – 29 February 2024
Time	Continuous Monitoring throughout February 2024
Monitoring Location	Continuous Environmental Monitoring Systems (CEMS)
Parameter	Various emission parameters of the Centralised Air Pollution Control Unit (CAPCS), Cogeneration Units (CHPs), and Ammonia Stripping Plant (ASP)
Exceedance Description	<p>1. Continuous monitoring was carried out at the CAPCS, CHPs, and ASP throughout the reporting period using the CEMS. According to the EM&A Manual, an exceedance is considered if the emission concentration of the concerned pollutants is higher than the emission limits stated in Tables 2.2, 2.3 and 2.5 of the EM&A Manual (Version F) for the CAPCS, CHPs, and ASP respectively. The concentrations of the concerned air pollutants were monitored on-line by the CEMS. Exceedances of various emission parameters were recorded on the CEMS including:</p> <ul style="list-style-type: none"> • Odour from CAPCS; • NO_x and SO₂ from CHP1; • NO_x and SO₂ from CHP2; • NO_x and SO₂ from CHP3; and • NO_x, SO₂, and NH₃ from ASP. <p>2. The Contractor has investigated the cause of the exceedances and identified that:</p> <ul style="list-style-type: none"> • The exceedances of Odour from CAPCS; NO_x and SO₂ from the CHPs; and the exceedances of NO_x, SO₂, and NH₃ from ASP occurred due to system instability. • Regarding the exceedances of Odour from the CAPCS, the Contractor has identified that a faulty sensor for H₂S may be the source of the problem, as the Total Odour value is calculated based on the sensor readings for H₂S and NH₃ for the CAPCS. • Regarding the NO_x exceedances from CHP1, the Contractor has identified that the Co-gen unit may have been burning lubrication oil, which caused many of the exceedances. • Regarding the NO_x exceedances from CHP2, the Contractor has identified that the exceedances may be attributed to the frequent stopping/ starting of the system. • Regarding the NO_x exceedances from CHP3, the Contractor has identified that the exceedances may be reduced by overhauling the CHP3. • Regarding the SO₂ exceedances from the CHPs, a quality assurance level 2 test (QAL2) was completed by a third-party laboratory that showed lower SO₂ values than those reported by the CEMS. The lower values measured by the laboratory was attributed to methane gas interference. Based on this study, it was proposed to implement a correction factor in the CEMS to adjust for the methane gas interference. The MT and IEC have reviewed the proposal and have no objections. This correction factor is planned to be implemented after finalising the arrangement with the project proponent.

Investigation Report of CEMS Exceedances	
	<ul style="list-style-type: none"> The various exceedances from the ASP can be attributed to two items: a backpressure issue was identified which affected oxygen levels in the ASP operation. Additionally, the frequent starting and stopping of the system has been causing unstable process conditions during operation.
Action Taken / Action to be Taken	The Contractor investigated the reason for the exceedances and arranged Remedial Works and Follow-up Actions (see below).
Remedial Works and Follow-up Actions	<p>The following Remedial Works and Follow-up Actions have been / shall be implemented by the Contractor to address the above exceedances:</p> <ul style="list-style-type: none"> To address the exceedances of Odour from the CAPCS, the Contractor has ordered a new H₂S sensor to replace the faulty one and will be installed as soon as practicable. To address the NO_x exceedances from CHP1, the Contractor has ordered a spare part cylinder from the supplier to resolve the lubrication oil issue and will be installed as soon as practicable. To address the NO_x exceedances from CHP2, the Contractor is studying operational improvements to improve the efficiency of the process with a view to reducing the frequent stopping/ starting of the system. To address the NO_x exceedances from CHP3, the Contractor overhauled CHP3 in January 2024 and the number of exceedances has been reduced since that time, with a view to eliminating all exceedances as the process efficiency can be improved. To address the SO₂ exceedances from the CHPs, the Contractor has written a letter to EPD to request the implementation of the updated QAL2 mentioned above, having addressed all comments received from MT and IEC. To address the various exceedances from the ASP, the Contractor will conduct an overhaul of the ASP at the end of March 2024 to increase reliability. In addition, a drum screen is targeted to be installed by early March 2024 to decrease the solids entering the ASP in order to improve the efficiency and reliability of the system. Finally, a software issue has been resolved with the ASP which shall resolve the oxygen backpressure issue.

Prepared by: Alex Khawaja Waheed, MT Representative

Date: 8 March 2024

Investigation Report of Environmental Complaint (Odour Nuisance) – 19 February 2024

Project Ref. No.	ORRC-EC-002-20240219
Date	19 February 2024
Date of Notification	28 February 2024
Location	Site boundary along Sham Fung Road
Description	<p>During the daytime hours of 19 February 2024 (Monday), a complainant from outside of ORRC1 site premises called the government hotline to lodge a complaint as quoted below:</p> <p><i>投訴大嶼山小蠔灣深豐路有機資源回收中心發出刺鼻臭味，要求部門跟進及回覆。(original version)</i></p> <p><i>Complaint about the unpleasant odour emitted by the Organic Waste Recycling Centre on Sham Fung Road, Tai O, Lantau Island. Requesting the department to follow up and provide a response. (English translation)</i></p>
Action / Limit Levels	<p>Since five odour complaints were received within one week (19 February 2024, 20 February 2024, 21 February 2024 (2 complaints), and 22 February 2024), the Limit Level of Odour Nuisance was triggered (ref: Table 2.7 EM&A Manual Rev. F – July 2019).</p>
Possible reason for Non-compliance	<p>The Contractor has conducted an initial investigation following the complaint received on 19 February 2024. The odour nuisance may be due to the ongoing annual cleaning of the Suspension Buffer Tank (SBT), which required emptying the contents from the SBT via vacuum tank on 19 February 2024, and later also required opening of the tank at the ground level to allow for works access on 21 February 2024.</p> <p>Further investigation was conducted during a site visit by Environmental Protection Department Regional Office (EPD RO) on 22 February 2024. The inspection noted the emptying of the SBT tank and a pile of pre-digest mixture exposed to the open air until a grab truck could arrive for clearance. These activities were likely the source of the odour nuisance and EPD RO recommended mitigation measures to be implemented.</p>
Action Taken / Action to be Taken	<p>The Contractor investigated the reason for the Environmental Complaint (odour nuisance) and arranged Remedial Works and Follow-up Actions (see below).</p>
Remedial Works and Follow-up Actions	<p>Following the complaint of odour nuisance received, OSCAR implemented mitigation measures to address the odour source at the SBT tank in accordance with Table 2.8 – Event and Action Plan for Odour Monitoring of the EM&A Manual (Rev. F – July 2019):</p> <ul style="list-style-type: none"> • The Contractor temporarily stopped the cleaning of the SBT tank to reduce the odour from 22-28 February 2024; • Implemented the use of canvas barriers around the working area to prevent the spread of odour; • Set up fans to inject deodourisers to the air around the SBT tank; • Channelled some of the air being emitted from the SBT tank and cleaning process through the CAPCS system to mitigate the odour; • Arranged for daily ad-hoc odour patrols around the perimeter of the ORRC1 site;

Investigation Report of Environmental Complaint (Odour Nuisance) – 19 February 2024

- After odour patrol on 26 February 2024 found no sampling locations with an Odour Intensity of Level 2 or higher, ceased additional odour patrols; and
- The other mitigation measures will remain in place until SBT tank cleaning is finished, currently scheduled to end on 20 March 2024.

Prepared by: Alex Khawaja Waheed, MT Representative

Date: 8 March 2024

Investigation Report of Environmental Complaint (Odour Nuisance) – 20 February 2024

Project Ref. No.	ORRC-EC-003-20240220
Date	20 February 2024
Date of Notification	8 March 2024
Location	Site boundary along Sham Fung Road
Description	<p>During the daytime hours of 20 February 2024 (Tuesday), a complainant from outside of ORRC1 site premises called the government hotline to lodge a complaint as quoted below:</p> <p><i>投訴O·PARK1 (有機資源回收中心第一期) 處理廚餘發出臭味造成環境衛生滋擾。(original version)</i></p> <p><i>Complaint about the foul odour emitted from O·PARK1 (Phase 1 of the Organic Resource Recycling Centre), causing environmental and sanitation disturbances. (English translation)</i></p>
Action / Limit Levels	<p>Since five odour complaints were received within one week (19 February 2024, 20 February 2024, 21 February 2024 (2 complaints), and 22 February 2024), the Limit Level of Odour Nuisance was triggered (ref: Table 2.7 EM&A Manual Rev. F – July 2019).</p>
Possible reason for Non-compliance	<p>The Contractor has conducted an initial investigation following the complaint received on 19 February 2024. The odour nuisance may be due to the ongoing annual cleaning of the Suspension Buffer Tank (SBT), which required emptying the contents from the SBT via vacuum tank on 19 February 2024, and later also required opening of the tank at the ground level to allow for works access on 21 February 2024.</p> <p>Further investigation was conducted during a site visit by Environmental Protection Department Regional Office (EPD RO) on 22 February 2024. The inspection noted the emptying of the SBT tank and a pile of pre-digest mixture exposed to the open air until a grab truck could arrive for clearance. These activities were likely the source of the odour nuisance and EPD RO recommended mitigation measures to be implemented.</p>
Action Taken / Action to be Taken	<p>The Contractor investigated the reason for the Environmental Complaint (odour nuisance) and arranged Remedial Works and Follow-up Actions (see below).</p>
Remedial Works and Follow-up Actions	<p>Following the complaint of odour nuisance received, OSCAR implemented mitigation measures to address the odour source at the SBT tank in accordance with Table 2.8 – Event and Action Plan for Odour Monitoring of the EM&A Manual (Rev. F – July 2019):</p> <ul style="list-style-type: none"> • The Contractor temporarily stopped the cleaning of the SBT tank to reduce the odour from 22-28 February 2024; • Implemented the use of canvas barriers around the working area to prevent the spread of odour; • Set up fans to inject deodourisers to the air around the SBT tank; • Channelled some of the air being emitted from the SBT tank and cleaning process through the CAPCS system to mitigate the odour; • Arranged for daily ad-hoc odour patrols around the perimeter of the ORRC1 site;

Investigation Report of Environmental Complaint (Odour Nuisance) – 20 February 2024

- After odour patrol on 26 February 2024 found no sampling locations with an Odour Intensity of Level 2 or higher, ceased additional odour patrols; and
- The other mitigation measures will remain in place until SBT tank cleaning is finished, currently scheduled to end on 20 March 2024.

Prepared by: Alex Khawaja Waheed, MT Representative

Date: 8 March 2024

Investigation Report of Environmental Complaint (Odour Nuisance) – 21 February 2024 (1 st Complaint)	
Project Ref. No.	ORRC-EC-004-20240221
Date	21 February 2024
Date of Notification	8 March 2024
Location	Site boundary along Sham Fung Road
Description	<p>During the daytime hours of 21 February 2024 (Wednesday), a complainant from outside of ORRC1 site premises called the government hotline to lodge a complaint as quoted below:</p> <p><i>投訴深豐路O-PARK及龍運巴士小蠔灣車廠一帶有大量異味傳出。(original version)</i></p> <p><i>Complaint about the strong odour emanating from the vicinity of Sham Fung Road, O-PARK1 and Long Win Bus Siu Ho Wan Depot. (English translation)</i></p>
Action / Limit Levels	Since five odour complaints were received within one week (19 February 2024, 20 February 2024, 21 February 2024 (2 complaints), and 22 February 2024), the Limit Level of Odour Nuisance was triggered (ref: Table 2.7 EM&A Manual Rev. F – July 2019).
Possible reason for Non-compliance	<p>The Contractor has conducted an initial investigation following the complaint received on 19 February 2024. The odour nuisance may be due to the ongoing annual cleaning of the Suspension Buffer Tank (SBT), which required emptying the contents from the SBT via vacuum tank on 19 February 2024, and later also required opening of the tank at the ground level to allow for works access on 21 February 2024.</p> <p>Further investigation was conducted during a site visit by Environmental Protection Department Regional Office (EPD RO) on 22 February 2024. The inspection noted the emptying of the SBT tank and a pile of pre-digest mixture exposed to the open air until a grab truck could arrive for clearance. These activities were likely the source of the odour nuisance and EPD RO recommended mitigation measures to be implemented.</p>
Action Taken / Action to be Taken	The Contractor investigated the reason for the Environmental Complaint (odour nuisance) and arranged Remedial Works and Follow-up Actions (see below).
Remedial Works and Follow-up Actions	<p>Following the complaint of odour nuisance received, OSCAR implemented mitigation measures to address the odour source at the SBT tank in accordance with Table 2.8 – Event and Action Plan for Odour Monitoring of the EM&A Manual (Rev. F – July 2019):</p> <ul style="list-style-type: none"> • The Contractor temporarily stopped the cleaning of the SBT tank to reduce the odour from 22-28 February 2024; • Implemented the use of canvas barriers around the working area to prevent the spread of odour; • Set up fans to inject deodourisers to the air around the SBT tank; • Channelled some of the air being emitted from the SBT tank and cleaning process through the CAPCS system to mitigate the odour; • Arranged for daily ad-hoc odour patrols around the perimeter of the ORRC1 site;

Investigation Report of Environmental Complaint (Odour Nuisance) – 21 February 2024 (1st Complaint)

- After odour patrol on 26 February 2024 found no sampling locations with an Odour Intensity of Level 2 or higher, ceased additional odour patrols; and
- The other mitigation measures will remain in place until SBT tank cleaning is finished, currently scheduled to end on 20 March 2024.

Prepared by: Alex Khawaja Waheed, MT Representative

Date: 8 March 2024

Investigation Report of Environmental Complaint (Odour Nuisance) – 21 February 2024 (2nd Complaint)

Project Ref. No.	ORRC-EC-005-20240221
Date	21 February 2024
Date of Notification	8 March 2024
Location	Site boundary along Sham Fung Road
Description	<p>During the daytime hours of 21 February 2024 (Wednesday), a complainant from outside of ORRC1 site premises called the government hotline to lodge a complaint as quoted below:</p> <p><i>投訴大嶼山深豐路有機資源回收中心第1期發出臭味，造成滋擾，要求部門跟進。(original version)</i></p> <p><i>Complaint about the foul odour emitted from Phase 1 of the Organic Resource Recycling Centre on Sham Fung Road, Lantau Island, causing disturbances. Requesting the department to follow up. (English translation)</i></p>
Action / Limit Levels	<p>Since five odour complaints were received within one week (19 February 2024, 20 February 2024, 21 February 2024 (2 complaints), and 22 February 2024), the Limit Level of Odour Nuisance was triggered (ref: Table 2.7 EM&A Manual Rev. F – July 2019).</p>
Possible reason for Non-compliance	<p>The Contractor has conducted an initial investigation following the complaint received on 19 February 2024. The odour nuisance may be due to the ongoing annual cleaning of the Suspension Buffer Tank (SBT), which required emptying the contents from the SBT via vacuum tank on 19 February 2024, and later also required opening of the tank at the ground level to allow for works access on 21 February 2024.</p> <p>Further investigation was conducted during a site visit by Environmental Protection Department Regional Office (EPD RO) on 22 February 2024. The inspection noted the emptying of the SBT tank and a pile of pre-digest mixture exposed to the open air until a grab truck could arrive for clearance. These activities were likely the source of the odour nuisance and EPD RO recommended mitigation measures to be implemented.</p>
Action Taken / Action to be Taken	<p>The Contractor investigated the reason for the Environmental Complaint (odour nuisance) and arranged Remedial Works and Follow-up Actions (see below).</p>
Remedial Works and Follow-up Actions	<p>Following the complaint of odour nuisance received, OSCAR implemented mitigation measures to address the odour source at the SBT tank in accordance with Table 2.8 – Event and Action Plan for Odour Monitoring of the EM&A Manual (Rev. F – July 2019):</p> <ul style="list-style-type: none"> • The Contractor temporarily stopped the cleaning of the SBT tank to reduce the odour from 22-28 February 2024; • Implemented the use of canvas barriers around the working area to prevent the spread of odour; • Set up fans to inject deodourisers to the air around the SBT tank; • Channelled some of the air being emitted from the SBT tank and cleaning process through the CAPCS system to mitigate the odour; • Arranged for daily ad-hoc odour patrols around the perimeter of the ORRC1 site;

Investigation Report of Environmental Complaint (Odour Nuisance) – 21 February 2024 (2nd Complaint)

- After odour patrol on 26 February 2024 found no sampling locations with an Odour Intensity of Level 2 or higher, ceased additional odour patrols; and
- The other mitigation measures will remain in place until SBT tank cleaning is finished, currently scheduled to end on 20 March 2024.

Prepared by: Alex Khawaja Waheed, MT Representative

Date: 8 March 2024

Investigation Report of Environmental Complaint (Odour Nuisance) – 22 February 2024

Project Ref. No.	ORRC-EC-006-20240222
Date	22 February 2024
Date of Notification	28 February 2024
Location	Site boundary along Sham Fung Road
Description	<p>During the daytime hours of 22 February 2024 (Thursday), a complainant from outside of ORRC1 site premises called the government hotline to lodge a complaint as quoted below:</p> <p><i>投訴人指東涌翔東路近深豐路 L/P FB7275至FB7278 範圍內發出酸臭味，並指附近有有機資源回收中心，不清楚是否由此發出，要求部門跟進。(original version)</i></p> <p><i>The complainant alleges that there is a sour and pungent odour emanating from within the vicinity of L/P FB7275 to FB7278 on Cheung Tung Road, Tung Chung, near Sham Fung Road. They also mention the presence of an organic waste recycling centre nearby but are unsure if the odour originates from there. They request the department to follow up on the matter. (English translation)</i></p>
Action / Limit Levels	<p>Since five odour complaints were received within one week (19 February 2024, 20 February 2024, 21 February 2024 (2 complaints), and 22 February 2024), the Limit Level of Odour Nuisance was triggered (ref: Table 2.7 EM&A Manual Rev. F – July 2019).</p>
Possible reason for Non-compliance	<p>The Contractor has conducted an initial investigation following the complaint received on 19 February 2024. The odour nuisance may be due to the ongoing annual cleaning of the Suspension Buffer Tank (SBT), which required emptying the contents from the SBT via vacuum tank on 19 February 2024, and later also required opening of the tank at the ground level to allow for works access on 21 February 2024.</p> <p>Further investigation was conducted during a site visit by Environmental Protection Department Regional Office (EPD RO) on 22 February 2024. The inspection noted the emptying of the SBT tank and a pile of pre-digest mixture exposed to the open air until a grab truck could arrive for clearance. These activities were likely the source of the odour nuisance and EPD RO recommended mitigation measures to be implemented.</p>
Action Taken / Action to be Taken	<p>The Contractor investigated the reason for the Environmental Complaint (odour nuisance) and arranged Remedial Works and Follow-up Actions (see below).</p>
Remedial Works and Follow-up Actions	<p>Following the complaint of odour nuisance received, OSCAR implemented mitigation measures to address the odour source at the SBT tank in accordance with Table 2.8 – Event and Action Plan for Odour Monitoring of the EM&A Manual (Rev. F – July 2019):</p> <ul style="list-style-type: none"> • The Contractor temporarily stopped the cleaning of the SBT tank to reduce the odour from 22-28 February 2024; • Implemented the use of canvas barriers around the working area to prevent the spread of odour; • Set up fans to inject deodourisers to the air around the SBT tank;

Investigation Report of Environmental Complaint (Odour Nuisance) – 22 February 2024

- Channelled some of the air being emitted from the SBT tank and cleaning process through the CAPCS system to mitigate the odour;
- Arranged for daily ad-hoc odour patrols around the perimeter of the ORRC1 site;
- After odour patrol on 26 February 2024 found no sampling locations with an Odour Intensity of Level 2 or higher, ceased additional odour patrols; and
- The other mitigation measures will remain in place until SBT tank cleaning is finished, currently scheduled to end on 20 March 2024.

Prepared by: Alex Khawaja Waheed, MT Representative

Date: 8 March 2024