South East New Territories (SENT) Landfill Extension

Quarterly Environmental Monitoring & Audit Report No.22

PREPARED FOR

翠谷工程有限公司
Green Valley Landfill, Limited

Green Valley Landfill Ltd.

DATE
8 October 2024

REFERENCE
0465169

翠谷工程有限公司
Green Valley Landfill, Limited

South East New Territories (SENT) Landfill Extension

Environmental Certification Sheet
EP-308/2008/C and FEP-01/308/2008/C

Reference Document/Plan

Document/Plan to be Certified/Verified:	Quarterly Environmental Monitoring & Audit Report No. 22 for South East New Territories (SENT) Landfill Extension
Date of Report:	8 October 2024

Reference EP Condition

EM&A Manual: Section 11.4

The quarterly EM&A summary report shall be prepared by the ET, certified by the ET Leader and verified by the IEC. The quarterly EM&A summary report should contain all information listed under Section 11.4 of the approved EM&A Manual.

ET Certification

I hereby certify that the above referenced document/plan complies with the above referenced EM&A Manual requirement.

Terence Fong,
Environmental Team Leader:

(ERM Hong-Kong, Limited)

Date: 8 October 2024

IEC Verification

I hereby verify that the above referenced document/plan complies with the above referenced EM&A Manual requirement.

Claudine Lee,
Independent Environmental Checker:

(Meinhardt Infrastructure and Environment Limited)

Date: 14 October 2024

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South East New Territories (SENT) Landfill Extension

Quarterly Environmental Monitoring & Audit Report No.22

0465169

Terence Fong
Partner

ERM-Hong Kong, Limited
2509, 25/F One Harbourfront
18 Tak Fung Street
Hunghom
Kowloon
Hong Kong

CONTENTS

EXECUTIVE SUMMARY

The SENT Landfill Extension (SENTX) forms an integral part in the Strategic Plan in maintaining the continuity of landfill capacity in the Hong Kong for the cost-effective and environmentally satisfactory disposal of waste. ERM-Hong Kong, Limited (ERM) is commissioned to undertake the role of Environmental Team (ET) for the construction, operation/restoration and aftercare of SENTX Project ("the Project") in accordance with the requirements specified in the Environmental Permit (EP), updated Environmental Monitoring and Audit (EM&A) Manual, the approved Environmental Impact Assessment (EIA) Report of the Project taking account of the latest design and other relevant statutory requirements. The construction (not including works related to site clearance and preparation) and operation of the Project commenced on 2 January 2019 and 21 November 2021, respectively.

This Quarterly EM&A report presents the EM&A works carried out during the period from 1 April 2024 to 30 June 2024 for the Project in accordance with the updated EM&A Manual.

EXCEEDANCE OF ACTION AND LIMIT LEVELS FOR AIR QUALITY

Two exceedances of Limit Levels for landfill gas flare stack emission (Benzene) and one exceedance of Limit Levels for landfill gas flare stack emission (Carbon Monoxide (CO)) were recorded for air quality monitoring in the reporting period. The landfill gas flare stack emission (Benzene and CO) exceedances on 18 April 2024 and landfill gas flare stack emission (Benzene) exceedance on 9 May 2024 were considered Project-related upon further investigation.

EXCEEDANCE OF ACTION AND LIMIT LEVELS FOR NOISE

No exceedance of Action and Limit Levels for operation/restoration phase noise monitoring was recorded in the reporting period.

EXCEEDANCE OF ACTION AND LIMIT LEVELS FOR WATER QUALITY

Two exceedances of the Limit Levels for surface water (Suspended Solids (SS)), one exceedance of the Limit Levels for surface water (ammoniacal-nitrogen), one exceedance of the Limit Levels for groundwater (ammoniacal-nitrogen) and four exceedances of the Limit Levels for groundwater (Chemical Oxygen Demand (COD)) were recorded for water quality monitoring in the reporting period.

The surface water (ammoniacal-nitrogen) exceedance at DP3 and the surface water (SS) exceedances at DP4 and DP6 on 6 May 2024 and 12 June 2024 were considered Project-related upon further investigation. The monitoring frequency shall be increased to weekly in accordance with Table 4.5b of the updated EM&A Manual until no exceedance of Limit Level. However, the Ammoniacal-nitrogen results at DP3 of the additional monitoring event conducted on 30 May 2024 are well below the Limit Level and the weekly surface water monitoring at DP3 was therefore not triggered. Weekly surface water quality monitoring (SS) were continued at DP4 and DP6 until no exceedance of Limit Level.

The groundwater (ammoniacal-nitrogen) exceedance at MWX-5 on 3 May 2024 and the groundwater (COD) exceedances at MWX-6 on 10 April 2024 and 3 May 2024, at MWX-5 on 3 May 2024 and at MWX-7 on 12 June 2024 were considered non Project-related upon further investigation.

EXCEEDANCE OF ACTION AND LIMIT LEVELS FOR LANDFILL GAS

No exceedance of Action and Limit Levels for operation/restoration phase landfill gas monitoring was recorded in the reporting period.

ENVIRONMENTAL COMPLAINTS, SUMMONS AND PROSECUTIONS

There were no complaints, notification of summons or prosecution recorded in the reporting period.

REPORTING CHANGE

There was no reporting change in the reporting period.

1. INTRODUCTION

1.1 BACKGROUND

The SENT Landfill Extension (SENTX) forms an integral part in the Strategic Plan in maintaining the continuity of landfill capacity in the Hong Kong for the cost-effective and environmentally satisfactory disposal of waste. The *Environmental Impact Assessment (EIA) Report* and the associated *Environmental Monitoring and Audit (EM&A) Manual* for the construction, operation, restoration and aftercare of the SENTX (hereafter referred to as "the Project") have been approved under the *Environmental Impact Assessment Ordinance (EIAO)* in May 2008 (Register No.: AEIAR-117/2008) (hereafter referred to as the approved EIA Report) and an Environmental Permit (EP-308/2008) (EP) was granted by the Director of Environmental Protection (DEP) on 5 August 2008.

Since then, applications for Variation of an Environmental Permit (No. VEP-531/2017) were submitted to EPD and the Variation of Environmental Permits (EP-308/2008/A and EP-308/2008/B) were granted on 6 January 2012 and 20 January 2017, respectively, as the Hong Kong SAR Government has decided to reduce the scale of the design scheme of SENTX assessed in the approved EIA Report and SENTX will only receive construction waste. In May 2018, a Further Environmental Permit (FEP) (FEP-01/308/2008/B) was granted to the SENTX's contractor, Green Valley Landfill, Limited (GVL). In February 2024, VEPs (EP-308/2008/C and FEP-01/308/2008/C) were granted to the Environmental Infrastructure Division of EPD and GVL, regarding updates on alternative measures to minimise surface odour emission.

ERM-Hong Kong, Limited (ERM) and Meinhardt Infrastructure and Environment Limited (Meinhardt) are commissioned to undertake the roles of Environmental Team (ET) and the Independent Environmental Checker (IEC), respectively, to undertake the EM&A activities for the Project in accordance with the requirements specified in the EP, updated EM&A Manual [(1)], approved EIA Report [(2)] taking account of the latest design and other relevant statutory requirements.

1.2 PROJECT DESCRIPTION

The SENTX is a piggyback landfill, occupying the southern part of the existing SENT Landfill (including its infrastructure area) and 13 ha of Tseung Kwan O (TKO) Area 137. A layout plan of the SENTX is shown in **Figure 1.1**. Under the latest design, the SENTX has a net void capacity of about 6.5 Mm^3 and provides an additional lifespan of about 6 years, commencing operation upon exhaustion of the SENT Landfill. The SENTX will receive construction waste only.

The key implementation milestones of the Project are indicatively summarised in **Table 1.1**. The construction works and operation of the Project commenced on 2 January 2019 and 21 November 2021, respectively.

(1) ERM (2018). South East New Territories (SENT) Landfill Extension: Environmental Monitoring & Audit Manual

(2) ERM (2007). South East New Territories (SENT) Landfill Extension – Feasibility Study: Environmental Impact Assessment Report

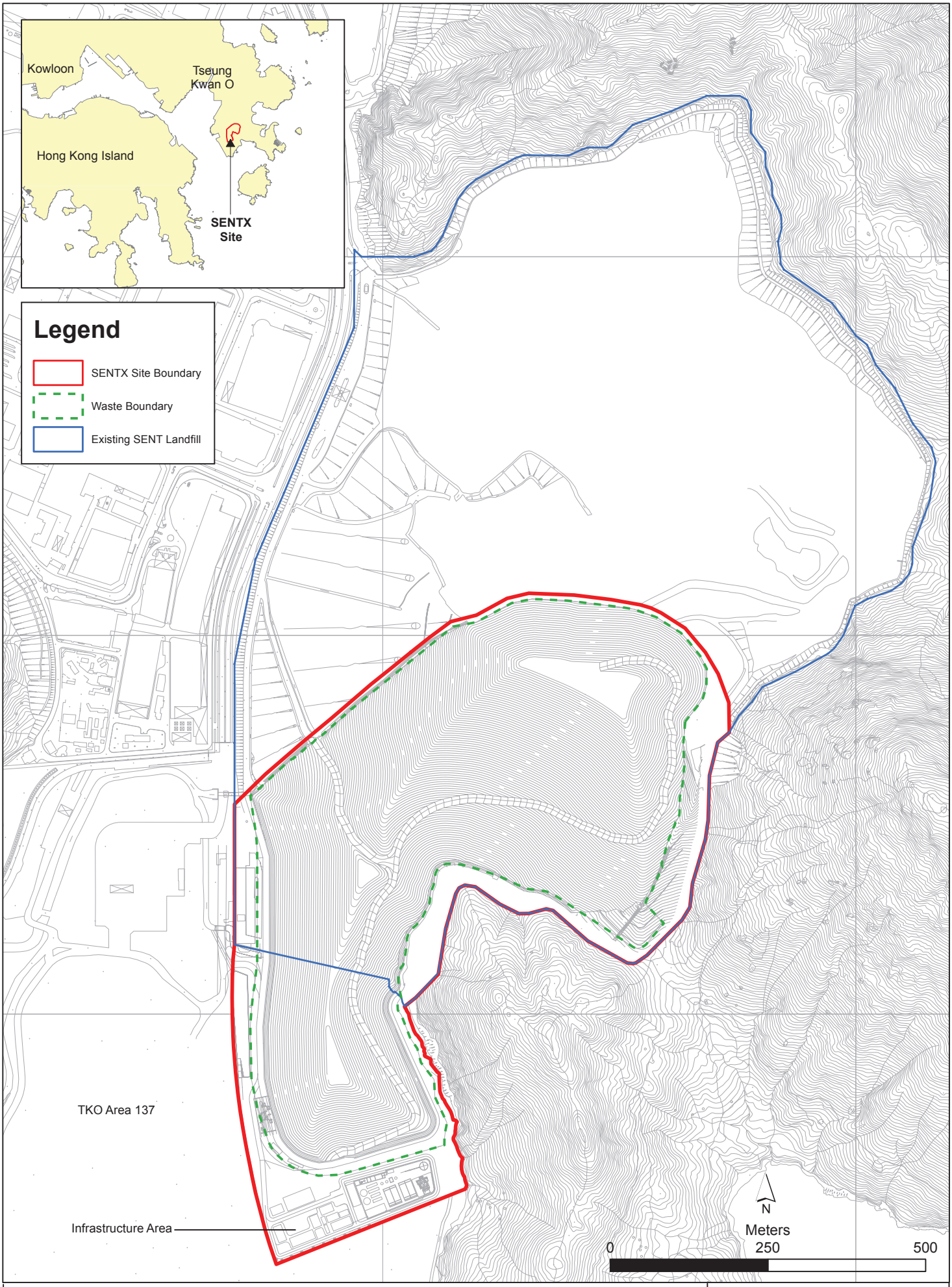

Figure 1.1

Layout Plan of SENTX

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Date: 5/9/2018

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TABLE 1.1 ESTIMATED KEY DATES OF IMPLEMENTATION PROGRAMME

Key Stage of the Project	Indicative Date
Start construction	2 January 2019
Commissioning of new infrastructure facilities	2020
Demolition of existing infrastructure facilities	2021
Start waste intake at SENTX	21 November 2021
Estimated exhaustion date of. SENTX	2027
End of aftercare for SENTX	2059

The major construction works of the SENTX includes:

- Site formation at the TKO Area 137 and the existing infrastructure area at SENT Landfill;
- Construction of surface and groundwater drainage systems;
- Construction of the leachate containment and collection systems;
- Construction of new leachate and landfill gas treatment facilities, site offices, maintenance yards at the new infrastructure area;
- Construction of new pipelines to transfer the leachate and landfill gas collected from the existing SENT Landfill to the treatment facilities at the new infrastructure area;
- Construction of the site access and new waste reception facilities; and
- Demolition of the facilities at the existing SENT Landfill infrastructure area.

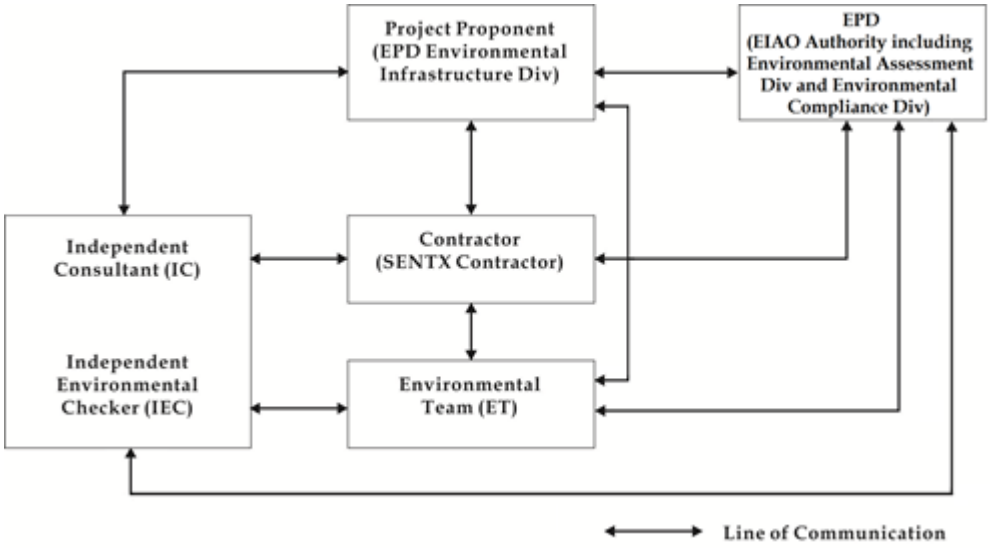
1.3 SCOPE OF THE EM&A REPORT

This is the Quarterly EM&A Report for the Project which summarises the key findings of the EM&A programme during the reporting period from 1 April 2024 to 30 June 2024 for the construction and operation works.

1.4 PROJECT ORGANISATION

The organisation structure of the Project is presented in **Figure 1.2**.

FIGURE 1.2 ORGANISATION CHART



Contact details of the key personnel are summarised in **Table 1.2** below.

TABLE 1.2 CONTACT INFORMATION OF KEY PERSONNEL

Party	Position	Name	Telephone
Contractor (Green Valley Landfill Limited)	Project Manager	Carl Lai	2706 8829
Environmental Team (ET) (ERM-Hong Kong, Limited)	ET Leader	Terence Fong	2271 3156
Independent Environmental Checker (IEC) (Meinhardt Infrastructure and Environment Limited)	IEC	Claudine Lee	2859 5409

1.5 SUMMARY OF CONSTRUCTION WORKS

The programme of the construction is shown in **Annex A**. As informed by the Contractor, the major works carried out in this reporting period include:

April 2024

- Maintenance and improvement of temporary surface water drainage; and
- Restoration of Phase 1 Cell 1X, 2X and Phase 2 Cell 3X west slopes.

May 2024

- Maintenance and improvement of temporary surface water drainage; and
- Restoration of Phase 1 Cell 1X, 2X and Phase 2 Cell 3X west slopes.

June 2024

- Maintenance and improvement of temporary surface water drainage; and
- Restoration of Phase 1 Cell 1X, 2X and Phase 2 Cell 3X west slopes.

The implementation schedule of the mitigation measured recommended in the Updated EM&A Manual is presented in **Annex B**.

1.6 SUMMARY OF EM&A PROGRAMME REQUIREMENTS

The status for all environmental aspects are presented in **Table 1.3**. The EM&A requirements remained unchanged during the reporting period.

TABLE 1.3 SUMMARY OF STATUS FOR THE ENVIRONMENTAL ASPECTS UNDER THE UPDATED EM&A MANUAL

Parameters	Status
Air Quality	
Baseline Monitoring	The results of baseline air quality monitoring were reported in Baseline Monitoring Report and Pre-operation Baseline Monitoring Report and submitted to EPD under EP Condition 3.3
Impact Monitoring	On-going
Noise	
Baseline Monitoring	The results of baseline noise monitoring were reported in Baseline Monitoring Report and submitted to EPD under EP Condition 3.3
Impact Monitoring	On-going
Water Quality	
Baseline Monitoring	The results of baseline surface water quality monitoring were reported in Baseline Monitoring Report and Pre-operation Baseline Monitoring Report and submitted to EPD under EP Condition 3.3
Impact Monitoring	On-going
Landfill Gas	
Impact Monitoring	On-going
Waste Management	
Waste Monitoring	On-going
Landscape and Visual	
Baseline Monitoring	The results of baseline landscape and visual monitoring were reported in Baseline Monitoring Report and submitted to EPD under EP Condition 3.3
Operation Phase Audit	On-going
Site Environmental Audit	
Regular Site Inspection	On-going
Complaint Hotline and Email Channel	On-going
Environmental Log Book	On-going

Taking into account the operation works, impact monitoring of air quality, noise, water quality, landfill gas and waste management were carried out in the reporting period. The impact monitoring schedule of air quality, noise, water quality and landfill gas monitoring are provided in **Annex C**.

The EM&A programme also involved environmental site inspections and related auditing conducted by the ET for checking the implementation of the required environmental mitigation measures recommended in the approved EIA Report and relevant EP submissions. To promote the environmental awareness and enhance the environmental performance of the contractors, environmental trainings and regular environmental management meetings were conducted during the reporting period, which are summarized as below:

- Three environmental management meeting was held with the Contractor, ET, IEC and EPD on 24 April 2024, 23 May 2024 and 20 June 2024; and
- Environmental toolbox trainings on the following topics were provided by the Contractor to the workers:
    - Cut Down Construction Dust on 10 April 2024;
    - Mosquito Prevention for Workers in Construction Sites on 25 April 2024;
    - Renewable Energy on 16 May 2024;
    - Chemical Waste Handling on 21 May 2024;
    - Wastewater Management on 13 June 2024; and
    - Quality Powered Mechanical Equipment (QPME) on 18 June 2024.

1.7 STATUS OF STATUTORY ENVIRONMENTAL COMPLIANCE WITH THE ENVIRONMENTAL PERMIT

The status of statutory environmental compliance with the EP conditions under the EIAO, submission status under the EP and implementation status of mitigation measures are presented in **Table 1.4**.

TABLE 1.4 STATUS OF SUBMISSIONS REQUIRED UNDER THE EP AND IMPLEMENTATION STATUS OF MITIGATION MEASURES

EP Condition	Submission / Implementation Status	Status
2.3	Management Organisation of Main Construction Companies	Submitted and accepted by EPD.
2.4	Setting up of Community Liaison Group	Community Liaison Group was set up.
2.5	Submission of Detailed Landfill Gas Hazard Assessment Report	Submitted and accepted by EPD on 10 January 2019.
2.6	Submission of Restoration and Ecological Enhancement Plan	Submitted to EPD on 28 June 2019.
2.7	Setting up of Trial Nursery	Trial Nursery works was commenced on 28 August 2019.
2.8	Advance Screen Planting	Advance Screen Planting works were completed on 28 June 2019.
2.9	Provision of Multi-layer Composite Liner System	Under implementation.

1.8 STATUS OF OTHER STATUTORY ENVIRONMENTAL REQUIREMENTS

The environmental licenses and permits (including EP, *Water Pollution Control Ordinance* (WPCO) discharge license, registration as a chemical waste producer, and construction noise permit) that are valid in the reporting period are presented in **Table 1.5**. No non-compliance with environmental statutory requirements was identified.

TABLE 1.5 STATUS OF STATUTORY ENVIRONMENTAL REQUIREMENTS

Description	Ref No.	Status
Environmental Permit	EP-308/2008	Granted on 5 August 2008
Variation of Environmental Permit	EP-308/2008/A	Granted on 6 January 2012
	EP-308/2008/B	Granted on 20 January 2017
	EP-308/2008/C	Granted on 29 February 2024
Further Environmental Permit	FEP-01/308/2008/B	Granted on 16 May 2018
	FEP-01/308/2008/C	Granted on 29 February 2024
Water Discharge License under WPCO (Permit Holder: GVL)	Licence No.: WT00041447-2022	Validity from 17 June 2022 to 30 June 2024
Billing Account for Disposal of Construction Waste	Chit Account Number: 5001692	Approved on 28 December 2005
Registration as a Chemical Waste Producer (Permit Holder: GVL)	5296-839-G2228-01	Issued on 31 December 2015
Construction Noise Permit (Permit Holder: GVL)	GW-RE1146-23	Validity from 15 September 2023 to 14 March 2024
	GW-RE0307-24	Validity from 22 March 2024 to 14 September 2024

2. EM&A RESULTS

The EM&A programme for the Project required environmental monitoring for air quality, noise, water quality and landfill gas as well as environmental site inspections for air quality, noise, water quality, landfill gas, waste management, and landscape and visual impacts. The EM&A requirements and related findings for each component are summarised in the following sections.

2.1 AIR QUALITY MONITORING

2.1.1 DUST MONITORING

2.1.1.1 MONITORING REQUIREMENTS AND EQUIPMENT

According to the updated EM&A Manual of the Project, impact dust monitoring (in term of Total Suspended Particulates (TSP)) was carried out at the four designated locations along the site boundary (i.e. AM1, AM2, AM3 and AM4) during the operation/restoration phase, at a 6-day interval.

The Action and Limit Levels of the dust monitoring is provided in **Table 2.1** below.

TABLE 2.1 ACTION AND LIMIT LEVELS FOR 24-HOUR TSP

Monitoring Station	Action Level	Limit Level
AM1 - SENTX Site Boundary (North)	260 μg m-³	260 μg m-³
AM2 - SENTX Site Boundary (West, near DP3)		
AM3 - SENTX Site Boundary (West, near RC15)		
AM4 - SENTX Site Boundary (West, near EPD building)		

High volume air samplers (HVSs) in compliance with the specifications listed under Section 3.2.2 of the updated EM&A Manual were used to measure 24-hour TSP levels at the dust monitoring stations. The HVSs were calibrated upon installation and thereafter at bi-monthly intervals to check the validity and accuracy of the results.

The equipment used in the impact dust monitoring programme and monitoring locations are summarised in **Table 2.2** and illustrated in **Figure 2.1**, respectively.

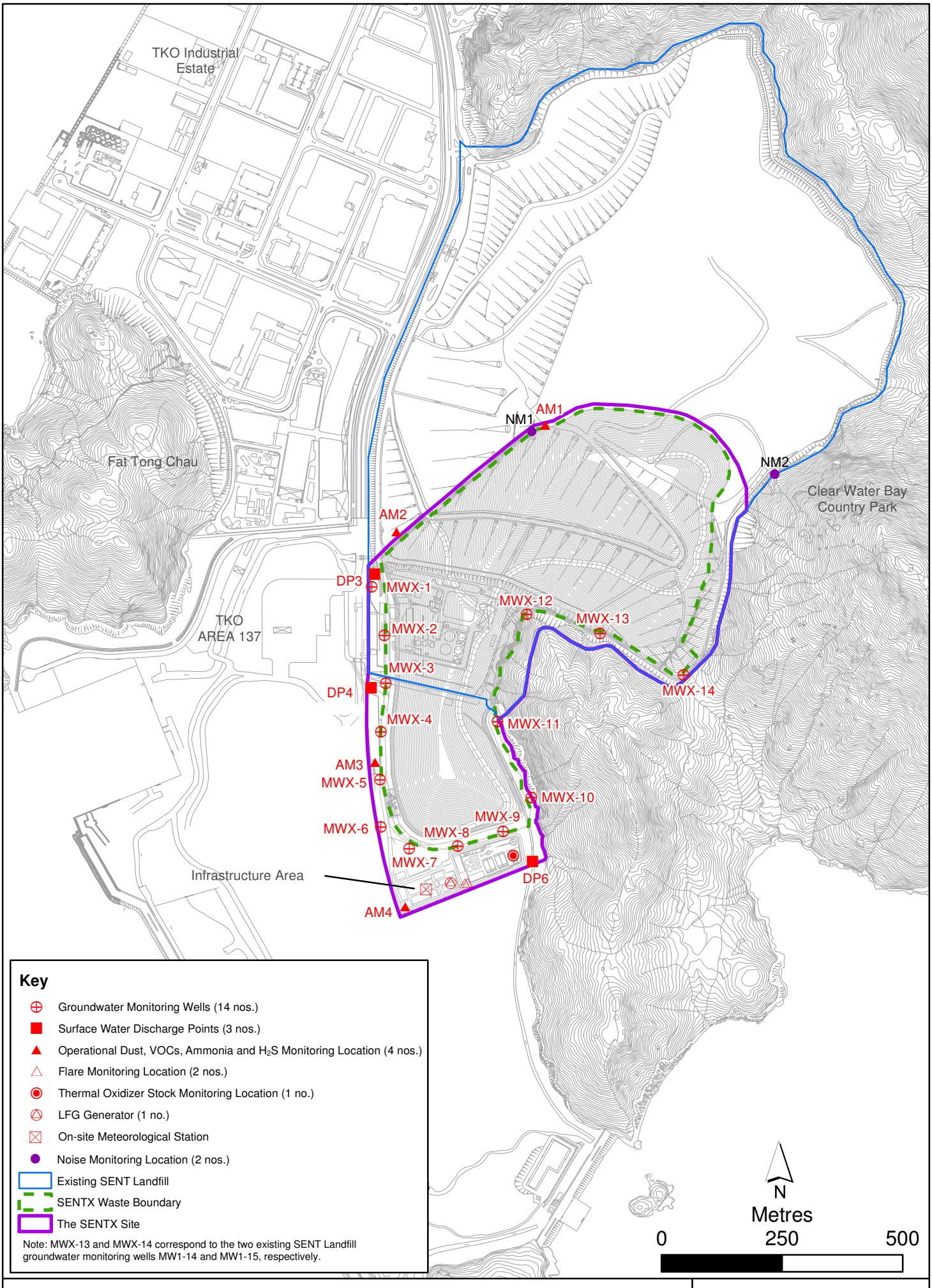


Figure 2.1

Environmental Monitoring Locations

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Date: 19/11/2019

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TABLE 2.2 DUST MONITORING DETAILS

Monitoring Station	Location	Parameter	Frequency and Duration	Monitoring Dates	Equipment
AM1	SENTX Site Boundary (North)	24-hour TSP	Once every 6 days	1, 7, 13, 19, 25 Apr 2024 1, 7, 13, 19, 25, 31 May 2024 6, 12, 18, 24, 30 Jun 2024	Tisch TE-5170 (S/N: 3976)
AM2	SENTX Site Boundary (West, near DP3)				Tisch TE-5170 (S/N: 3573)
AM3	SENTX Site Boundary (West, near RC15)				Tisch TE-5170 (S/N: 3572)
AM4	SENTX Site Boundary (West, near EPD building)				Tisch TE-5170 (S/N: 3957)

2.1.1.2 MONITORING SCHEDULE FOR THE REPORTING MONTH

The schedule for dust monitoring during the reporting period is provided in **Annex C**.

2.1.1.3 RESULTS AND OBSERVATIONS

The 24-hour TSP monitoring results are summarised in **Table 2.3**. The detailed monitoring results and the graphical presentation of the 24-hour TSP monitoring results at each monitoring location are provided in **Annex D1**.

TABLE 2.3 SUMMARY OF 24-HOUR TSP MONITORING RESULTS IN THE REPORTING PERIOD

Month	Monitoring Station	Average 24-hr TSP Concentration (μg m^{-3})		Action Level (μg/m^3)	Limit Level (μg/m^3)
		Average	Range		
April 2024	AM1	74	43 – 100	260	260
	AM2	82	66 – 117	260	260
	AM3	79	56 – 97	260	260
	AM4	65	49 – 78	260	260
May 2024	AM1	108	32 – 241	260	260
	AM2	98	41 – 167	260	260
	AM3	127	28 – 242	260	260
	AM4	61	28 – 104	260	260
June 2024	AM1	39	36 – 46	260	260
	AM2	76	51 – 139	260	260
	AM3	73	56 – 96	260	260
	AM4	43	43 – 60	260	260

The major dust sources in the reporting period included fugitive dust emission from exposed area in SENTX, as well as nearby operations of the TKO Area 137 Fill Bank.

No Action and Limit Levels exceedance was recorded for TSP monitoring in the reporting period. No action is thus required to be undertaken in accordance with the Event and Action Plan presented in **Annex D2**.

2.1.1.4 METEOROLOGICAL DATA

Meteorological data obtained from the SENTX on-site meteorological monitoring station was used for the dust monitoring and is shown in **Annex D3**. It is considered that meteorological data obtained at the on-site meteorological monitoring station is representative of the Project area and could be used for the operation/restoration phase dust monitoring programme for the Project.

2.1.2 ODOUR MONITORING

2.1.2.1 MONITORING REQUIREMENTS

According to the updated EM&A Manual of the Project, odour patrol was carried out along the site boundary during the operation/ restoration phase.

During the first month of operation, daily odour patrol (3 times per day) was conducted jointly by the ET and the IEC. The odour intensity detected was based on that determined by the IEC. In addition, an independent party (ALS Technichem (HK) Pty Ltd.) was appointed to undertake odour patrol together with the ET and IEC three times per week. During these patrols, the odour intensity detected was based on that determined by the independent third party.

Reduction of odour monitoring frequency from Period 1 (daily, three times per day) to Period 2 (weekly) was approved by EPD on 4 February 2022. Weekly odour patrol was conducted jointly by the ET and the IEC from 10 February 2022. In addition, an independent party (ALS Technichem (HK) Pty Ltd.) was appointed to undertake odour patrol together with the ET and IEC once every two weeks.

Reduction of odour monitoring frequency from Period 2 (weekly) to Period 3 (monthly) was approved by EPD on 2 June 2022. Monthly odour patrol was conducted jointly by the ET and the IEC from 28 June 2022. In addition, an independent party (ALS Technichem (HK) Pty Ltd.) was appointed to undertake odour patrol together with the ET and IEC quarterly. Furthermore, the odour patrol route has been reviewed against the latest construction/ operation programme and approved by EPD on 17 June 2024.

The Action and Limit Levels for odour patrol is provided in **Table 2.4** below.

TABLE 2.4 ACTION AND LIMIT LEVELS FOR ODOUR PATROL

Parameter	Action Level	Limit Level
Perceived odour intensity and odour complaints	• Odour intensity ≥ Class 2 recorded; or • One documented complaint received	• Odour intensity ≥ Class 3 recorded on 2 consecutive patrol [(a) (b)]

Notes:
(a) i.e. either Class 3-strong or Class 4-extreme odour intensity.
(b) The exceedances of the odour intensity do not need to be recorded at the same location.

Odour patrol was conducted by trained personnel/competent persons with a specific sensitivity to a reference odour (i.e. on reference materials n-butanol with the concentration of 50ppm in nitrogen (v/v)) in compliance with Section 3.7.2 of the updated EM&A Manual patrolling and sniffing along the SENTX Site boundary to detect any odour.

The odour monitoring programme and patrol route are summarised in **Table 2.5** and illustrated in **Figure 2.2** respectively.

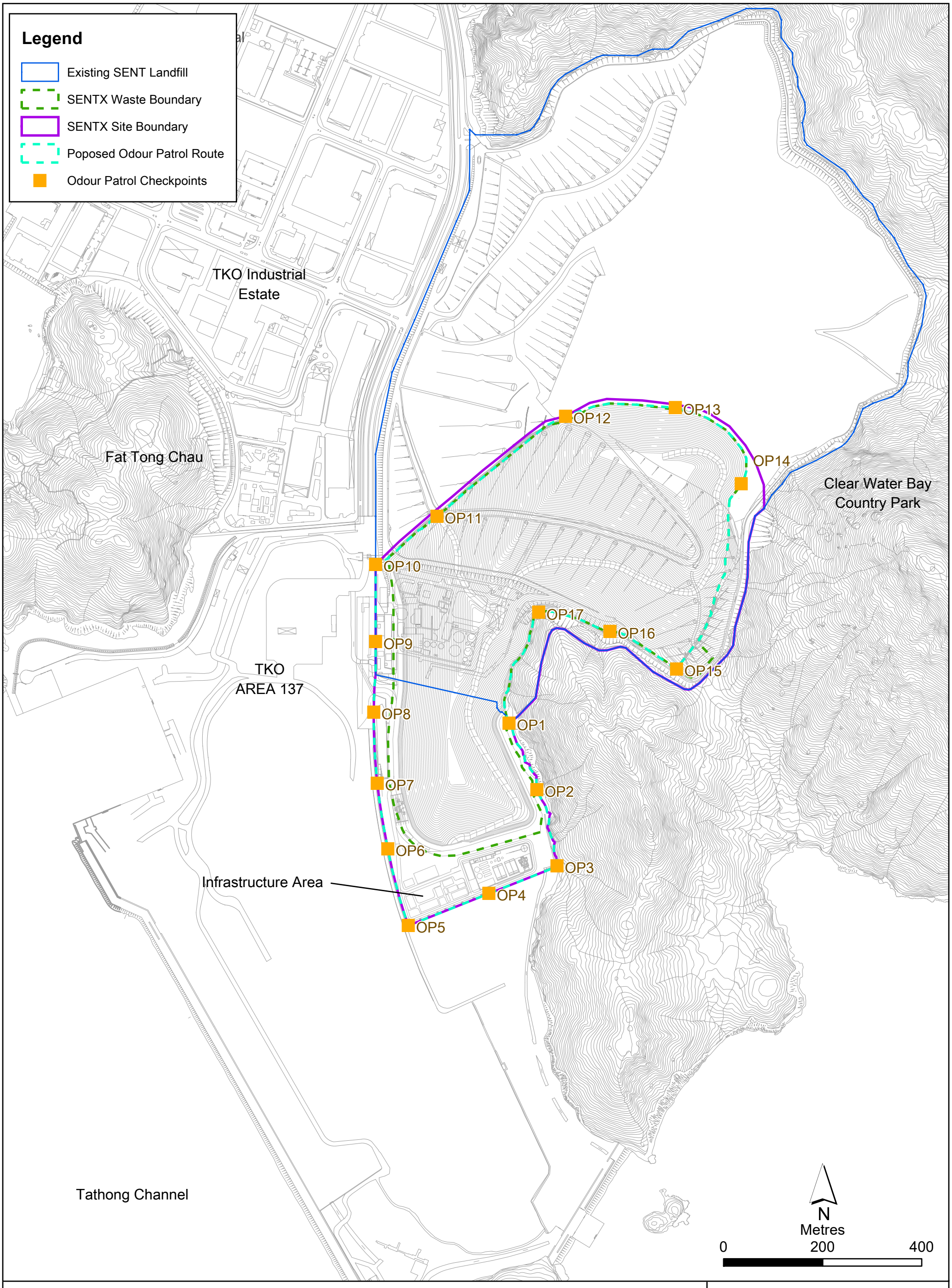

Figure 2.2

Odour Patrol Route for
Operation/ Restoration Phase Odour Monitoring

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Date: 25/3/2024

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TABLE 2.5 ODOUR MONITORING DETAILS

Patrol Locations	Parameters	Patrol Frequency [a]	Monitoring Dates
Patrol along the SENTX Site Boundary (Checkpoints OP1 – OP17)	Odour Intensity (see *Table 2.6*)	Period 1 - First month of operation Daily, three times a day in the morning, afternoon and evening/night (between 18:00 and 22:00 hrs) conducted by the ET and the IEC Three times per week on different days conducted by an independent third party together with the ET and IEC [b] Period 2 - Three months following period 1 [c] Weekly conducted by the ET and the IEC Once every two weeks conducted by an independent third party together with the ET and IEC [b] Period 3 - Throughout operation following period 2 [c] Monthly conducted by the ET and the IEC Quarterly conducted by an independent third party together with the ET and IEC [b]	Conducted by ET & IEC: 24 Apr 2024, 21 May 2024 Conducted by an independent third party, ET & IEC: 18 Jun 2024

Notes:
(a) Reduction of monitoring frequency will be subject to the monitoring results to demonstrate environmentally acceptable performance.
(b) Patrol shall be scheduled so that they are carried out together with the patrols to be carried out jointly by the ET and the IEC.
(c) Commencement of each period will be justified by the ET Leader and verified by the IEC and will be subject to agreement with the EPD (EIAO Authority) and Project Proponent.

TABLE 2.6 ODOUR INTENSITY LEVEL

Class	Odour Intensity	Description
0	Not Detected	No odour perceived or an odour so weak that it cannot be easily characterised or described.
1	Slight	Identified odour, slight

Class	Odour Intensity	Description
2	Moderate	Identified odour, moderate
3	Strong	Identified odour, strong
4	Extreme	Severe odour

2.1.2.2 MONITORING SCHEDULE FOR THE REPORTING MONTH

The schedule for odour patrol during the reporting period is provided in **Annex C**.

2.1.2.3 RESULTS AND OBSERVATIONS

The odour monitoring results are summarised and provided in **Table 2.7** and **Annex D4**, respectively.

TABLE 2.7 SUMMARY OF ODOUR MONITORING RESULTS IN THE REPORTING PERIOD

Odour Checkpoints	Odour Intensity Class	Action Level	Limit Level
OP1	0	Odour intensity ≥ Class 2 recorded	Odour intensity ≥ Class 3 recorded on 2 consecutive patrol
OP2	0		
OP3	0		
OP4	0		
OP5	0		
OP6	0		
OP7	0		
OP8	0		
OP9	0		
OP10	0 - 1		
OP11	0 - 1		
OP12	1		
OP13	0		
OP14	0 - 1		
OP15	0		
OP16	0		
OP17	0		

The potential odour source in the reporting period included Cell 4X tipping area at SENTX, the nearby vegetation and Towngas plant. All the odour monitoring results were below the Action and Limit Levels in the reporting period. No action is thus required to be undertaken in accordance with the Event and Action Plan presented in **Annex D2**.

2.1.3 THERMAL OXIDISER, LANDFILL GAS FLARE AND LANDFILL GAS GENERATOR STACK EMISSION MONITORING

2.1.3.1 MONITORING REQUIREMENTS AND EQUIPMENT

According to the updated EM&A Manual of the Project, the performance of the thermal oxidiser, landfill gas flare and landfill gas generator was monitored when they are in operation. Gas samples were collected from the stack of the thermal oxidizer, landfill gas flare and landfill gas generator for laboratory analysis for NO_2, CO, SO_2, Benzene and Vinyl chloride and in-situ analysis for exhaust gas velocity at monthly interval and for laboratory analysis for non-methane organic compounds and ammonia (for thermal oxidizer only) at quarterly interval. The operating conditions of the thermal oxidiser, landfill gas flare and landfill gas generator were also monitored continuously.

The Limit Levels for stack emission of the thermal oxidiser, landfill gas flare and landfill gas generator are provided in **Tables 2.8 – 2.10** below.

TABLE 2.8 LIMIT LEVELS FOR STACK EMISSION OF THE THERMAL OXIDISER

Parameters	Limit Level
NO_2	1.58 gs^{-1}
CO	0.53 gs^{-1}
SO_2	0.07 gs^{-1}
Benzene	3.01 x 10^{-2} gs^{-1}
Vinyl chloride	2.23 x 10^{-3} gs^{-1}
Gas combustion temperature	850^{o}C (minimum)
Exhaust gas exit temperature	443K (minimum) [(a)]
Exhaust gas velocity	7.5 ms^{-1} (minimum) [(a)]

Note:
(a) Level under full load condition.

TABLE 2.9 LIMIT LEVELS FOR STACK EMISSION OF THE LANDFILL GAS FLARE

Parameters	Limit Level
NO_2	0.97 gs^{-1}
CO	2.43 gs^{-1}
SO_2	0.22 gs^{-1}
Benzene	4.14×10^{-4} gs^{-1}
Vinyl chloride	2.60×10^{-4} gs^{-1}
Gas combustion temperature	815°C (minimum)
Exhaust gas exit temperature	923 K (minimum) (a)
Exhaust gas velocity	9.0 m s^{-1} (minimum) (a)

Note:
(a) Level under full load condition.

TABLE 2.10 LIMIT LEVELS FOR STACK EMISSION OF THE LANDFILL GAS GENERATOR

Parameters	Limit Level
NO_2	1.91 gs^{-1}
CO	2.48 gs^{-1}
SO_2	0.528 gs^{-1}
Benzene	2.47×10^{-4} gs^{-1}
Vinyl chloride	1.88×10^{-5} gs^{-1}
Gas combustion temperature	450°C (minimum)
Exhaust gas exit temperature	723K (minimum) (a)
Exhaust gas velocity	30.0 ms^{-1} (minimum) (a)

Note:
(a) Level under full load condition.

Gas samples were collected from the centroid of the stack with stainless steel sampling probe, into inert sample containers (i.e. Canister and Tedlar Bag) and transferred to ALS Technichem (HK) Pty Ltd. (HOKLAS Registration No. 066) laboratory within 24 hours of collection for direct analysis on a gas chromatography within 48 hours after collection. The flue gas velocity of the gas stream at the exhaust of thermal oxidize was determined by S-Pitot tube during the emission sampling.

The stack emission monitoring programme and monitoring locations are summarised in **Table 2.11** and illustrated in **Figure 2.1**, respectively.

TABLE 2.11 THERMAL OXIDISER, LANDFILL GAS FLARE AND LANDFILL GAS GENERATOR STACK EMISSION MONITORING DETAILS

Monitoring Location	Parameter	Frequency	Monitoring Date
Stack of Thermal Oxidiser	Laboratory analysis for • NO_2 • CO • SO_2 • Benzene • Vinyl chloride In-situ analysis for • Exhaust gas velocity	Monthly for the first 12 months of operation and thereafter at quarterly intervals	19 Apr 2024, 10 May 2024, 26 Jun 2024
	Laboratory analysis for • Non-methane organic compounds	Quarterly for the 1st year of operation (b)	10 May 2024
	Laboratory analysis for • Ammonia • Gas combustion temperature • Exhaust temperature • Exhaust gas velocity (a)	Quarterly	10 May 2024
	• Gas combustion temperature • Exhaust temperature • Exhaust gas velocity (a)	Continuously	1 Apr – 30 Jun 2024
Stack of Landfill Gas Flare	Laboratory analysis for • NO_2 • CO • SO_2 • Benzene • Vinyl chloride In-situ analysis for • Exhaust gas velocity	Monthly for the first 12 months of operation and thereafter at quarterly intervals	18 Apr 2024, 9 May 2024, 17 Jun 2024
	Laboratory analysis for • Non-methane organic compounds	Quarterly for the 1st year of operation (b)	9 May 2024

Monitoring Location	Parameter	Frequency	Monitoring Date
Stack of Landfill Gas Flare	• Gas combustion temperature • Exhaust temperature • Exhaust gas velocity (a)	Continuously	1 Apr – 30 Jun 2024
Stack of Landfill Gas Generator	Laboratory analysis for • NO_2 • CO • SO_2 • Benzene • Vinyl chloride In-situ analysis for • Exhaust gas velocity	Monthly for the first 12 months of operation and thereafter at quarterly intervals	18 Apr 2024, 9 May 2024, 17 Jun 2024
	Laboratory analysis for • Non-methane organic compounds	Quarterly for the 1st year of operation (b)	9 May 2024
	• Exhaust temperature • Exhaust gas velocity (a)	Continuously	1 Apr – 30 Jun 2024

Notes:
(a) The exhaust gas velocity is calculated based on the cross-section area of the stack and continuous monitored gas flow and combustion temperature data.
(b) The monitoring results are being reviewed to determine if monitoring of this parameter can be terminated upon agreement by the EIAO Authority, IEC and Project Proponent.

2.1.3.2 MONITORING SCHEDULE FOR THE REPORTING MONTH

The schedule for thermal oxidizer, landfill gas flare and landfill gas generator stack emission monitoring during the reporting period is provided in **Annex C**.

2.1.3.3 RESULTS AND OBSERVATIONS

The thermal oxidizer, landfill gas flare and landfill gas generator stack emission monitoring results and detailed continuous monitoring results are summarised in **Tables 2.12 - 2.14** and provided in **Annex D5**, respectively.

TABLE 2.12 SUMMARY OF THERMAL OXIDISER STACK EMISSION MONITORING IN THE REPORTING PERIOD

Parameters	Monitoring Results (Range in Bracket)	Limit Level
April 2024		
NO_2	1.58 gs^{-1}	1.58 gs^{-1}
CO	0.02 gs^{-1}	0.53 gs^{-1}
SO_2	0.01 gs^{-1}	0.07 gs^{-1}
Benzene	<1.0 x 10^{-4} gs^{-1}	3.01 x 10^{-2} gs^{-1}
Vinyl chloride	<1.0 x 10^{-4} gs^{-1}	2.23 x 10^{-3} gs^{-1}
Gas combustion temperature	907°C (896°C – 927°C)	850°C (minimum)
Exhaust gas exit temperature	1,225K (1,214K – 1,234K)	443K (minimum) (a)
Exhaust gas velocity	8.4 ms^{-1} (b)	7.5 ms^{-1} (minimum) (a)
May 2024		
NO_2	1.18 gs^{-1}	1.58 gs^{-1}
CO	0.03 gs^{-1}	0.53 gs^{-1}
SO_2	0.01 gs^{-1}	0.07 gs^{-1}
Benzene	<2.0 x 10^{-4} gs^{-1}	3.01 x 10^{-2} gs^{-1}
Vinyl chloride	<1.3 x 10^{-4} gs^{-1}	2.23 x 10^{-3} gs^{-1}
Non-Methane Organic Carbon	<0.003 gs^{-1}	-
Ammonia	0.0232 gs^{-1}	- (c)
Gas combustion temperature	900°C (894°C – 907°C)	850°C (minimum)
Exhaust gas exit temperature	1,225K (1,213K – 1,232K)	443K (minimum) (a)
Exhaust gas velocity	9.3 ms^{-1} (b)	7.5 ms^{-1} (minimum) (a)
June 2024		
NO_2	0.90 gs^{-1}	1.58 gs^{-1}
CO	0.02 gs^{-1}	0.53 gs^{-1}
SO_2	<0.01 gs^{-1}	0.07 gs^{-1}
Benzene	<2.0 x 10^{-4} gs^{-1}	3.01 x 10^{-2} gs^{-1}

Parameters	Monitoring Results (Range in Bracket)	Limit Level
Vinyl chloride	<1.2 x 10^{-4} gs^{-1}	2.23 x 10^{-3} gs^{-1}
Gas combustion temperature	900°C (897°C – 907°C)	850°C (minimum)
Exhaust gas exit temperature	1,217K (1,210K – 1,225K)	443K (minimum) (a)
Exhaust gas velocity	10.0 ms^{-1} (b)	7.5 ms^{-1} (minimum) (a)

Notes:
(a) Level under full load condition.
(b) The exhaust gas velocity was calculated based on the cross-section area of the stack and the gas flow and combustion temperature data measured during the stack emission monitoring.
(c) The emission limit for ammonia is under review and will be supplemented in subsequent revision.

TABLE 2.13 SUMMARY OF LANDFILL GAS FLARE STACK EMISSION MONITORING IN THE REPORTING PERIOD

Parameters	Monitoring Results (Range in Bracket)	Limit Level
April 2024		
NO_2	0.03 gs^{-1}	0.97 gs^{-1}
CO	2.61 gs^{-1}	2.43 gs^{-1}
SO_2	0.08 gs^{-1}	0.22 gs^{-1}
Benzene	6.479 x 10^{-3} gs^{-1}	4.14 x 10^{-4} gs^{-1}
Vinyl chloride	<1.14 x 10^{-4} gs^{-1}	2.60 x 10^{-4} gs^{-1}
Gas combustion temperature	Flare 1: 862°C (821°C – 892°C) Flare 2: 894°C (854°C – 934°C)	815°C (minimum)
Exhaust gas exit temperature	Flare 1: 1,121K (1,082K – 1,158K) Flare 2: 1,150K (1,106K – 1,187K)	923 K (minimum) (a)
Exhaust gas velocity	9.8 ms^{-1} (b)	9.0 m s^{-1} (minimum) (a)
May 2024		
NO_2	0.02 gs^{-1}	0.97 gs^{-1}
CO	0.02 gs^{-1}	2.43 gs^{-1}
SO_2	0.06 gs^{-1}	0.22 gs^{-1}
Benzene	6.73 x 10^{-4} gs^{-1}	4.14 x 10^{-4} gs^{-1}
Vinyl chloride	<1.01 x 10^{-4} gs^{-1}	2.60 x 10^{-4} gs^{-1}

Parameters	Monitoring Results (Range in Bracket)	Limit Level
Non-Methane Organic Carbon	<0.002 gs^{-1}	-
Gas combustion temperature	Flare 1: 867°C (826°C – 898°C) Flare 2: 896°C (856°C – 936°C)	815°C (minimum)
Exhaust gas exit temperature	Flare 1: 1,126K (1,087K – 1,159K) Flare 2: 1,152K (1,109K – 1,189K)	923 K (minimum) (a)
Exhaust gas velocity	8.9 ms^{-1} (b)	9.0 m s^{-1} (minimum) (a)
June 2024		
NO_2	0.02 gs^{-1}	0.97 gs^{-1}
CO	0.02 gs^{-1}	2.43 gs^{-1}
SO_2	0.05 gs^{-1}	0.22 gs^{-1}
Benzene	<1.21 x 10^{-4} gs^{-1}	4.14 x 10^{-4} gs^{-1}
Vinyl chloride	<9.7 x 10^{-5} gs^{-1}	2.60 x 10^{-4} gs^{-1}
Gas combustion temperature	Flare 1: 874°C (836°C – 907°C) Flare 2: 901°C (856°C – 951°C)	815°C (minimum)
Exhaust gas exit temperature	Flare 1: 1,139K (1,102K – 1,173K) Flare 2: 1,167K (1,124K – 1,214K)	923 K (minimum) (a)
Exhaust gas velocity	9.1 ms^{-1} (b)	9.0 m s^{-1} (minimum) (a)

Note:
(a) Level under full load condition.
(b) The exhaust gas velocity was calculated based on the cross-section area of the stack and the gas flow and combustion temperature data measured during the stack emission monitoring.

TABLE 2.14 SUMMARY OF LANDFILL GAS GENERATOR STACK EMISSION MONITORING IN THE REPORTING PERIOD

Parameters	Monitoring Results (Range in Bracket)	Limit Level
April 2024		
NO_2	0.101 gs^{-1}	1.91 gs^{-1}
CO	1.193 gs^{-1}	2.48 gs^{-1}
SO_2	<0.001 gs^{-1}	0.528 gs^{-1}
Benzene	1.3 x 10^{-4} gs^{-1}	2.47 x 10^{-4} gs^{-1}
Vinyl chloride	<1.07 x 10^{-5} gs^{-1}	1.88 x 10^{-5} gs^{-1}

Parameters	Monitoring Results (Range in Bracket)	Limit Level
Exhaust gas exit temperature	ENGA: 863K (848K – 892K) ENGB: 861K (836K – 881K)	723K (minimum) (a)
Exhaust gas velocity	9.7 ms^{-1} (b)	30.0 ms^{-1} (minimum) (a)
May 2024		
NO_2	0.084 gs^{-1}	1.91 gs^{-1}
CO	0.808 gs^{-1}	2.48 gs^{-1}
SO_2	<0.001 gs^{-1}	0.528 gs^{-1}
Benzene	5.6 x 10^{-5} gs^{-1}	2.47 x 10^{-4} gs^{-1}
Vinyl chloride	<1.04 x 10^{-5} gs^{-1}	1.88 x 10^{-5} gs^{-1}
Non-Methane Organic Carbons	0.0037 gs^{-1}	-
Exhaust gas exit temperature	ENGA: 868K (849K – 882K) ENGB: 866K (847K – 873K)	723K (minimum) (a)
Exhaust gas velocity	10.0 ms^{-1} (b)	30.0 ms^{-1} (minimum) (a)
June 2024		
NO_2	0.043 gs^{-1}	1.91 gs^{-1}
CO	0.711 gs^{-1}	2.48 gs^{-1}
SO_2	<0.001 gs^{-1}	0.528 gs^{-1}
Benzene	5.5 x 10^{-5} gs^{-1}	2.47 x 10^{-4} gs^{-1}
Vinyl chloride	<9.6 x 10^{-6} gs^{-1}	1.88 x 10^{-5} gs^{-1}
Exhaust gas exit temperature	ENGA: 858K (846K – 884K) ENGB: 860K (847K – 874K)	723K (minimum) (a)
Exhaust gas velocity	10.2 ms^{-1} (b)	30.0 ms^{-1} (minimum) (a)

Notes:
(a) Level under full load condition.
(b) The exhaust gas velocity was calculated based on the cross-section area of the stack and the gas flow and combustion temperature data measured during the stack emission monitoring.

Limit Level exceedances were recorded for landfill gas flare stack emission monitoring in the reporting period and actions in accordance with the Event and Action Plan in **Annex D2** were undertaken and the investigation reports are presented in **Annex D9**.

Based on the investigation conducted for the monitoring event with potential Limit Levels exceedances with the Contractor and the IEC, the landfill gas flare stack emission (Benzene

and CO) exceedances on 18 April 2024 and landfill gas flare stack emission (Benzene) exceedance on 9 May 2024 were considered Project-related upon further investigation.

The Contractor was reminded to implement all relevant mitigation measures for the construction and operation works and maintain good site practice. The ET will keep track on the monitoring data and ensure Contractor's compliance of the environmental requirements.

2.1.4 AMBIENT VOCS, AMMONIA AND H2S MONITORING

2.1.4.1 MONITORING REQUIREMENTS AND EQUIPMENT

According to the updated EM&A Manual of the Project, ambient VOCs, ammonia and H_2S monitoring was carried out at the four designated locations along the site boundary (i.e. AM1, AM2, AM3 and AM4) during the operation/restoration phase, at quarterly interval.

The Limit Levels for ambient VOCs, ammonia and H_2S monitoring is provided in **Table 2.15** below.

TABLE 2.15 LIMIT LEVELS FOR AMBIENT VOCS, AMMONIA AND H2S MONITOIRNG

Parameters	**Limit Level (μg m^{-3})**
Methane	NA [(a)]
Ammonia	180
H_2S	42
Dichlorodifluoro-methane	NA [(a)]
Vinyl Chloride	26
Methanol	2,660
Ethanol	19,200
Dimethylsulphide	8
Carbon Disulphide	150
Methylene Chloride	3,530
Chloroform	99
Methyl propionate	353
Butan-2-ol	667
1.1.1-Trichloroethane	5,550
1.2-Dichloroethane	210
Benzene	33
Carbon Tetrachloride	64
Dipropyl ether	NA [(a)]

Parameters	Limit Level (μg m^{-3})
Heptane	2,746
Trichloroethylene	5,500
Ethyl propionate	29
Methyl butanoate	30
Methanethiol	10
Toluene	1,244
Ethyl butanoate	71
Propyl benzene	19
Octane	7,942
Propyl propionate	276
1.2-Dibromoethane (EDB)	39
Butyl acetate	7,240
Tetrachloroethylene	1,380
Ethyl benzene	738
Nonane	11,540
Ethanethiol	13
Decanes	3,608
Limonene	212
Butyl benzene	47
Undecane	5,562
Butanethiol	4
Terpenes	NA (a)
Xylenes	534
Dichlorobenzene	120

Notes:
(a) No relevant WHO/USEPA/CARB's ambient criteria, odour thresholds and WEL available.

2.1.4.2 VOCS

Ambient air samples were drawn into the pre-cleaned and vacuum canister directly when the valve of the flow controller (with preset flow rate) was opened. After sampling, the valve will

be closed manually and the canister with VOCs gas samples were transported for laboratory analysis.

2.1.4.3 METHANE

Pre-cleaned Tedlar bag was placed in the vacuum chamber. Ambient air was collected in the Tedlar bag under the vacuum condition when the pump is switched on. The Tedlar bag was filled up to 90% of total capacity to avoid leakage and bag deformation. After sampling, pump is switched off and the valve of Tedlar bag was closed manually. The air samples were transported back to laboratory for analysis.

2.1.4.4 AMMONIA

Calibrated personal air pump was used to pump the air through a sulfuric acid-treated silica gel sorbent tube. Gaseous ammonia in air was then trapped in the sorbent tube. The tube was transported back to laboratory for analysis.

2.1.4.5 H_2S

H_2S in air is collected in mid-get impingers by aspirating a measured volume of air through an alkaline suspension of cadmium hydroxide (as the absorbing solution). The sulphide is precipitated as cadmium sulphide to prevent air oxidation of the sulphide. Arabinogalactan is added to the cadmium hydroxide slurry prior to sampling to minimize photo-decomposition of the precipitated cadmium sulphide. The solution is transported back to laboratory for analysis.

All air samples collected for laboratory analysis were transported to ALS Technichem (HK) Pty Ltd. (HOKLAS Registration No. 066) laboratory within 24 hours and analysed within 48 hours.

The ambient VOCs, ammonia and H_2S monitoring programme and monitoring locations are summarised in **Table 2.16** and illustrated in **Figure 2.1**, respectively.

TABLE 2.16 AMBIENT VOCS, AMMONIA AND H2S MONITOIRNG DETAILS

Monitoring Station	Location	Parameter	Frequency	Monitoring Date
AM1	SENTX Site Boundary (North)	• Methane • Ammonia • A suite of VOCs [(a)] • H_2S	Quarterly	10 May 2024
AM2	SENTX Site Boundary (West, near DP3)			
AM3	SENTX Site Boundary (West, near RC15)			
AM4	SENTX Site Boundary (West, near EPD building)			

Notes:

(a) A suite of VOCs includes:

- Trichloroethylene
- Vinyl chloride
- Methylene chloride
- Chloroform
- 1,2-dichloroethane
- Butyl benzene
- Xylenes
- Decanes
- Undecane
- Limonene
- Dichlorobenzene
- Methyl butanoate
- Dipropyl ether
- Methanethiol

- 1,1,1-trichloroethane
- Carbon tetrachloride
- Tetrachloroethylene
- 1,2-dibromoethane
- Benzene
- Toluene
- Carbon disulphide
- Propyl benzene
- Ethyl benzene
- Terpenes
- Ethanol
- Butan-2-ol
- Dimethylsulphide
- Methyl propionate
- Ethyl propionate
- Propyl propionate
- Butyl acetate
- Ethyl butanoate
- Ethanethiol
- Butanethiol
- Methanol
- Heptanes
- Octanes
- Nonanes
- Dichlorodifluoro-methane
- Methane

2.1.4.6 MONITOIRNG SCHEDULE FOR THE REPORTING MONTH

The schedule for ambient VOCs, ammonia and H_2S monitoring during the reporting period is provided in **Annex C**.

2.1.4.7 RESULTS AND OBSERVATIONS

The ambient VOCs, ammonia and H_2S monitoring results are summarized in **Tables 2.17** and provided in **Annex D6**.

TABLE 2.17 SUMMARY OF AMBIENT VOCS, AMMONIA AND H2S MONITORING RESULTS IN THE REPORTING PERIOD

Parameters	**Limit Level (μg m⁻³)**	**Monitoring Results (μg m⁻³)**			
		AM1	**AM2**	**AM3**	**AM4**
Ammonia	180	35	48	53	49
H_2S	42	<15	<15	<15	<15
Methane	NA [a]	0.00018 %(v/v)	0.0003 %(v/v)	0.00019 %(v/v)	0.00019 %(v/v)
1.1.1-Trichloroethane	5,550	<0.8	<0.8	<0.8	<0.8
1.2-Dibromoethane (EDB)	39	<1.0	<1.0	<1.0	<1.0
1.2-Dichloroethane	210	0.3	0.4	0.3	0.3
Benzene	33	<0.5	<0.5	<0.5	<0.5
Butan-2-ol	667	<0.6	<0.6	<0.6	<0.6
Butanethiol	4	<1.2	<1.2	<1.2	<1.2
Carbon Disulphide	150	0.6	1.6	<0.5	0.5
Carbon Tetrachloride	64	<0.6	<0.6	<0.6	<0.6
Chloroform	99	<0.8	<0.8	<0.8	<0.8

Parameters	Limit Level (μg m^{-3})	Monitoring Results (μg m^{-3})			
		AM1	AM2	AM3	AM4
Decanes	3,608	<0.7	<0.7	<0.7	<0.7
Dichlorobenzene	120	<1.0	<1.0	<1.0	<1.0
Dichlorodifluoro-methane	NA [a]	1.6	1.6	1.8	1.8
Dimethylsulphide	8	<0.2	<0.2	<0.2	<0.2
Dipropyl ether	NA [a]	<0.8	<0.8	<0.8	<0.8
Limonene	212	<0.4	<0.4	<0.4	<0.4
Ethanethiol	13	<0.6	<0.6	<0.6	<0.6
Ethanol	19,200	6.9	5.6	<3.8	10.7
Ethyl butanoate	71	<1.0	<1.0	<1.0	<1.0
Ethyl propionate	29	<0.8	<0.8	<0.8	<0.8
Ethyl benzene	738	<0.5	<0.5	<0.5	<0.5
Heptane	2,746	<0.8	<0.8	<0.8	<0.8
Methanethiol	10	<0.4	<0.4	<0.4	<0.4
Methanol	2,660	64.1	67.8	32.8	65.8
Methyl butanoate	30	<0.8	<0.8	<0.8	<0.8
Methyl propionate	353	<0.7	<0.7	<0.7	<0.7
Methylene Chloride	3,530	1.2	1.3	1.3	1.3
Butyl acetate	76	<1.0	<1.0	<1.0	<1.0
Butyl benzene	47	<1.0	<1.0	<1.0	<1.0
Nonane	11,540	<0.9	<0.9	<0.9	<0.9
Propyl benzene	19	<0.8	<0.8	<0.8	<0.8
Octane	7,942	<0.9	<0.9	<0.9	<0.9
Propyl propionate	276	<1.0	<1.0	<1.0	<1.0
Terpenes	NA [a]	<0.8	<0.8	<0.8	<0.8
Tetrachloroethylene	1,380	<0.7	<0.7	<0.7	<0.7

Parameters	Limit Level ($\mu g\ m^{-3}$)	Monitoring Results ($\mu g\ m^{-3}$)			
		AM1	AM2	AM3	AM4
Toluene	1,244	<0.5	0.8	<0.5	<0.5
Trichloroethylene	5,500	<1.1	<1.1	<1.1	<1.1
Undecane	5,562	<1.2	<1.2	<1.2	<1.2
Vinyl Chloride	26	<0.3	<0.3	<0.3	<0.3
Xylenes	534	<0.5	0.5	<0.5	<0.5

Notes:
(a) No relevant WHO/USEPA/CARB's ambient criteria and WEL available.

All ambient VOCs, ammonia and H_2S monitoring results were below the Limit Levels in the reporting period. No action is thus required to be undertaken in accordance with the Event and Action Plan presented in **Annex D2**.

2.2 NOISE MONITORING

2.2.1 MONITORING REQUIREMENTS AND EQUIPMENT

According to the updated EM&A Manual of the Project, impact noise monitoring was conducted weekly at the monitoring location (i.e. NM1) to obtain one set of 30-minute measurement between 07:00 and 19:00 hours on normal weekdays.

The Action and Limit Levels for operational noise of the Project are provided in **Table 2.18** below.

TABLE 2.18 ACTION AND LIMIT LEVELS FOR OPERATIONAL NOISE

Time Period	Action Level [a]	Limit Level [b]
07:00 – 19:00 hrs on all days	When one documented complaint is received from any one of the noise sensitive receivers (NSRs) or 75 dB(A) recorded at the monitoring station	65 dB(A) at NSRs [c]
19:00 – 23:00 hrs on all days		65 dB(A) at NSRs [c]
23:00 – 07:00 hrs on all days		55 dB(A) at NSRs [c]

Notes:
(a) 75dB(A) along and at about 100m from the SENTX site boundary was set as the Action Level.
(b) Limits specified in the GW-TM and IND-TM for construction and operational noise, respectively.
(c) Limit Level only apply to operational noise without road traffic and construction activities noise.

Noise monitoring was performed by ALS Technichem (HK) Pty Ltd. (HOKLAS Registration No. 066) using sound level meter at the designated monitoring station NM1 (see **Figure 2.1**) in accordance with the requirements stipulated in the updated EM&A Manual. Acoustic calibrator was deployed to check the sound level meter at a known sound pressure level. Details of the deployed equipment are provided in **Table 2.19**.

TABLE 2.19 NOISE MONITORING DETAILS

Monitoring Station (1)	Location	Parameter	Frequency and Duration	Monitoring Dates	Equipment
NM1	SENTX Site Boundary (North)	$L_{eq\ (30\ min)}$ measurement between 07:00 and 19:00 hours on normal weekdays (Monday to Saturday)	Once per week for 30 mins during operation of the Project	2, 8, 15, 22 Apr 2024 2, 8, 14, 20, 27 May 2024 3, 14, 19, 25 Jun 2024	Sound Level Meter: Rion NL-52 (S/N: 00643049) Sound Level Meter: Rion NL-52 (S/N: 01010406) Acoustic Calibrator: CAL200 (S/N: 16878)

2.2.2 MONITORING SCHEDULE FOR THE REPORTING MONTH

The schedule for noise monitoring during the reporting period is provided in **Annex C**.

2.2.3 RESULTS AND OBSERVATIONS

A total of 13 impact noise monitoring events were scheduled during the reporting period. Results for noise monitoring are summarised in **Table 2.20**. The monitoring results and the graphical presentation of the data are provided in **Annex E1**.

TABLE 2.20 SUMMARY OF OPERATION NOISE MONITORING RESULTS IN THE REPORTING PERIOD

Month	Monitoring Station	Measured Noise Level $L_{eq\ (30\ min)}$, dB(A)		
		Average	Range	Action and Limit Level
April 2024	NM1	55.7	54.6 – 56.7	75
May 2024	NM1	54.7	51.1 – 60.8	75
June 2024	NM1	56.8	56.7 – 56.9	75

Major noise sources identified during the noise monitoring included noise from operations of the SENTX and the TKO Area 137 Fill Bank, aircrafts and insects.

No exceedance of the Action and Limit Levels for operation noise monitoring was recorded in the reporting period. No further mitigation measure was required in accordance with the Event and Action Plan presented in **Annex E2**.

2.3 WATER QUALITY MONITORING

2.3.1 SURFACE WATER QUALITY MONITORING

2.3.1.1 MONITORING REQUIREMENTS AND EQUIPMENT

According to the updated EM&A Manual of the Project, impact surface water quality monitoring was carried out at the three designated surface water discharge points (i.e. DP3, DP4 and DP6) at monthly intervals during operation/ restoration phase to ensure that the SENTX will not cause adverse water quality impact.

The parameters as listed in **Table 2.22** were determined by ALS Technichem (HK) Pty Ltd. (HOKLAS Registration No. 066).

The Limit Levels of the surface water quality impact monitoring are provided in **Table 2.21**.

TABLE 2.21 LIMIT LEVELS FOR SURFACE WATER QUALITY

Parameters	Limit Level
DP3	
Ammoniacal-nitrogen	> 0.5 mg/L
COD	> 80 mg/L
SS	> 30 mg/L
DP4 & DP6	
Ammoniacal-nitrogen	> 7.1 mg/L
COD	> 30 mg/L
SS	> 20 mg/L

Notes:
The limit levels specified for other parameters in *Table 10a of the Technical Memorandum Standards for Effluents Discharged into Drainage and Sewerage Systems, Inland and Coastal Waters* shall also be followed.

The locations of the monitoring stations for the Project are shown in **Figure 2.1**. All *in situ* monitoring instruments were checked, calibrated and certified by a laboratory accredited under HOKLAS or other international accreditation scheme before use, and subsequently re-calibrated at 3 monthly intervals throughout all stages of the surface water quality monitoring programme. Calibration for a DO meter was carried out before measurement according to the instruction manual of the equipment model. Details of the equipment used in the impact surface water quality monitoring works are provided in **Table 2.22**.

TABLE 2.22 IMPACT SURFACE WATER QUALITY MONITORING DETAILS

Monitoring Station	Location	Frequency	Monitoring Dates	Parameter	Equipment
DP3	Surface water discharge point DP3	Monthly	12 Apr 2024, 6 May 2024, 12 Jun 2024	• pH • Electrical conductivity (EC) • DO • SS • COD • BOD_5 • TOC • Ammoniacal–nitrogen • Nitrate-nitrogen • Nitrite–nitrogen • TKN • TN • Phosphate • Sulphate • Sulphide • Carbonate • Oil & Grease • Bicarbonate • Chloride • Sodium • Potassium • Calcium • Magnesium • Nickel • Manganese • Chromium • Cadmium • Copper • Lead • Iron • Zinc • Mercury • Boron	Horiba U-52G (S/N: AWE7D2V4)
DP4	Surface water discharge point DP4				
DP6	Surface water discharge point DP6				

2.3.1.2 MONITORING SCHEDULE FOR THE REPORTING MONTH

The schedule for surface water quality monitoring during the reporting period is provided in **Annex C**.

2.3.1.3 RESULTS AND OBSERVATIONS

Three regular monitoring events for impact surface water quality monitoring were scheduled at all designated monitoring stations during the reporting period. However, sampling could not be carried out at all monitoring stations in April 2024, DP4 on 6 May 2024 and DP3 on 12 June 2024 due to insufficient flow. Details of impact water quality monitoring event are provided in **Annex F1**.

Limit Level exceedances (Ammoniacal-nitrogen and SS) were recorded for surface water quality impact monitoring in the reporting period and actions in accordance with the Event and Action Plan presented in **Annex F2** were undertaken. Investigation report of the exceedances is presented in **Annex F6**.

Based on the investigation conducted for the monitoring event with potential Limit Levels exceedances with the Contractor and the IEC, the Ammoniacal-nitrogen exceedance at DP3 and SS exceedance at DP6 on 6 May 2024, and SS exceedance at DP4 on 12 June 2024 were found to be Project-related.

The monitoring frequency shall be increased to weekly in accordance with *Table 4.5b* of the updated EM&A Manual until no exceedance of Limit Level. However, the Ammoniacal-nitrogen results at DP3 of the additional monitoring event conducted on 30 May 2024 are well below the Limit Level and the weekly surface water monitoring at DP3 was therefore not triggered.

Weekly surface water quality monitoring (SS) was continued at DP6 in June 2024 until no exceedance of Limit Level. The additional surface water monitoring results (SS) at DP6 on 5 June 2024 complied with the Limit Level as stipulated in the updated EM&A Manual and hence the weekly surface water monitoring (SS) at DP6 shall be terminated. Regarding the SS exceedance at DP4 on 12 June 2024, additional surface water monitoring at DP4 for SS was scheduled on 24 June 2024, however, sampling could not be carried out due to insufficient flow. Additional surface water monitoring shall be conducted in the next reporting period to confirm findings.

The Contractor was reminded to implement all relevant mitigation measures for the construction works and maintain good site practice. The ET will keep track on the monitoring data and ensure Contractor's compliance of the environmental requirements.

2.3.2 LEACHATE MONITORING

2.3.2.1 MONITORING REQUIREMENTS AND EQUIPMENT

According to the updated EM&A Manual, continuous monitoring of leachate level and monthly monitoring of effluent quality were carried out during the operation/ restoration phase.

Reduction of effluent monitoring frequency (dry season) (from daily to monthly) was approved by EPD on 22 March 2022. Monthly effluent quality monitoring (dry season) shall be conducted from 23 March 2022. The reduction of effluent monitoring frequency (wet season) (from daily to monthly) was approved by EPD on 2 August 2022. Monthly effluent quality monitoring (wet season) shall be conducted from 3 August 2022.

Temperature, pH and volume of the effluent discharged from the leachate treatment plant were measured in-situ whereas the parameters as listed in **Table 2.24** were determined by ALS Technichem (HK) Pty Ltd. (HOKLAS Registration No. 066).

The Limit Levels of the leachate monitoring are provided in **Table 2.23**.

TABLE 2.23 LIMIT LEVELS FOR LEACHATE LEVELS AND EFFLUENT QUALITY

Parameters	Limit Level
Leachate Levels	
Leachate levels above the basal liner	1 m above the primary liner of the leachate containment system
Effluent Quality	
Temperature	> 43 °C
pH Value	6 – 10
Volume Discharged	>2,000 m³
Suspended Solids (SS)	> 800 mg/L
Phosphate	> 25 mg/L
Sulphate	> 800 mg/L
Total Inorganic Nitrogen [(a)]	> 100 mg/L
Biochemical Oxygen Demand (BOD)	> 800 mg/L

Parameters	Limit Level
Chemical Oxygen Demand (COD)	> 2,000 mg/L
Oil & Grease	> 20 mg/L
Boron	> 7,000 µg/L
Iron	> 5 mg/L
Cadmium	> 1 µg/L
Chromium	> 300 µg/L
Copper	> 1,000 µg/L
Nickel	> 700 µg/L
Zinc	> 700 µg/L

Note:
(a) Total Inorganic Nitrogen include Ammoniacal-nitrogen, Nitrite-nitrogen and Nitrate-nitrogen.

All *in situ* monitoring instruments were checked, calibrated and certified by a laboratory accredited under HOKLAS or other international accreditation scheme before use, and subsequently re-calibrated at 3 monthly intervals throughout all stages of the leachate quality monitoring programme. Details of the equipment used are provided in **Table 2.24**.

TABLE 2.24 LEACHATE LEVELS AND EFFLUENT QUALITY MONITORING DETAILS

Location	Frequency	Parameter	Monitoring Dates	Equipment
Leachate levels above the basal liner	Continuous	Leachate Levels	1 Apr – 30 Jun 2024	Pairs of pressure transducers
Effluent discharged from LTP	Daily for the first 3 months upon full operation of the LTP at wet season (Apr to Sep) and dry season (Oct to Mar), respectively and reduce to monthly thereafter subject to the monitoring results of the first 3 months for each season and agreement with the EIAO Authority, IEC and IC. [(a)]	*On-site Measurements*: • Volume • pH • Temperature *Laboratory analysis:* • Suspended Solids • COD • BOD_5 • TOC • Ammoniacal–nitrogen • Nitrate-nitrogen • Nitrite–nitrogen • Total Nitrogen • Sulphate • Phosphate • Oil & Grease	11 Apr 2024, 9 May 2024, 13 June 2024	Lutron PH-208 (S/N: TF31039) Lutron PH-208 (S/N: TF30605)

Location	Frequency	Parameter	Monitoring Dates	Equipment
		• Alkalinity • Chloride • Calcium • Potassium • Magnesium • Iron • Zinc • Copper • Chromium • Nickel • Cadmium • Boron		

Note:
(a) Reduction of monitoring frequency will be subject to the monitoring results to demonstrate environmentally acceptable performance.

2.3.2.2 MONITORING SCHEDULE FOR THE REPORTING MONTH

The schedule for leachate monitoring during the reporting period is provided in **Annex C**.

2.3.2.3 RESULTS AND OBSERVATIONS

The leachate levels and effluent quality monitoring results are summarised in **Table 2.25** and **Table 2.26**, respectively. The detailed monitoring results are provided in **Annex F3** and **Annex F4**, respectively.

TABLE 2.25 SUMMARY OF LEACHATE LEVELS IN THE REPORTING PERIOD

Monitoring Location	Average Leachate Head Levels (cm) (Range in Bracket)	Limit Level (cm)
April 2024		
Pump Station No. 1X (Cell 1X)		
Meter No. X-1	110 (102 – 119)	> 178
Meter No. X-2 [(a)]	124 (111 – 135)	
Average	117 (111 – 127)	
Pump Station No. 2X (Cell 2X)		
Meter No. X-3	107 (102 – 117)	> 180
Meter No. X-4	124 (93 – 137)	
Average	116 (98 – 127)	
Pump Station No. 3X (Cell 3X)		
Meter No. X-5	112 (102 – 119)	> 175
Meter No. X-6	112 (102 – 119)	
Average	112 (102 – 119)	
Pump Station No. 4X (Cell 4X)		

Monitoring Location	Average Leachate Head Levels (cm) (Range in Bracket)	Limit Level (cm)
Meter No. X-7	113 (100 – 122)	> 186
Meter No. X-8	112 (98 – 120)	
Average	112 (99 – 121)	
May 2024		
Pump Station No. 1X (Cell 1X)		
Meter No. X-1	104 (102 – 128)	> 178
Meter No. X-2	115 (93 – 119)	
Average	109 (99 – 123)	
Pump Station No. 2X (Cell 2X)		
Meter No. X-3	106 (102 – 120)	> 180
Meter No. X-4	121 (97 – 139)	
Average	114 (103 – 130)	
Pump Station No. 3X (Cell 3X)		
Meter No. X-5	112 (99 – 119)	> 175
Meter No. X-6	112 (99 – 119)	
Average	112 (99 – 119)	
Pump Station No. 4X (Cell 4X)		
Meter No. X-7	115 (100 – 142)	> 186
Meter No. X-8	114 (100 – 133)	
Average	114 (100 – 138)	
June 2024		
Pump Station No. 1X (Cell 1X)		
Meter No. X-1	101 (70 – 104)	> 178
Meter No. X-2 [(a)]	110 (88 – 119)	
Average	106 (79 – 111)	
Pump Station No. 2X (Cell 2X		
Meter No. X-3	110 (93 – 128)	> 180
Meter No. X-4	119 (93 – 139)	
Average	115 (100 – 130)	
Pump Station No. 3X (Cell 3X)		
Meter No. X-5	111 (97 – 119)	> 175
Meter No. X-6	111 (97 – 119)	
Average	111 (97 – 119)	

Monitoring Location	Average Leachate Head Levels (cm) (Range in Bracket)	Limit Level (cm)
Pump Station No. 4X (Cell 4X)		
Meter No. X-7	112 (100 – 120)	> 186
Meter No. X-8	110 (96 – 120)	
Average	111 (100 – 120)	

TABLE 2.26 SUMMARY OF EFFLUENT QUALITY MONITORING RESULTS IN THE REPORTING PERIOD

Parameters		Monitoring Results	Limit Level
April 2024			
Temperature	°C	33.1	> 43 °C
pH Value	pH unit	8.4	6 – 10
Volume Discharged	m^3	934	>2,000 m^3
Suspended Solids (SS)	mg/L	36.8	> 800 mg/L
Phosphate	mg/L	7.8	> 25 mg/L
Sulphate	mg/L	169	> 800 mg/L
Total Inorganic Nitrogen [a]	mg/L	36.67	> 100 mg/L
BOD	mg/L	10	> 800 mg/L
COD	mg/L	1130	> 2,000 mg/L
Oil & Grease	mg/L	<5	> 20 mg/L
Boron	µg/L	5960	> 7,000 µg/L
Iron	mg/L	2.44	> 5 mg/L
Cadmium	µg/L	<1.0	> 1 µg/L
Chromium	µg/L	140	> 300 µg/L
Copper	µg/L	<10	> 1,000 µg/L
Nickel	µg/L	129	> 700 µg/L
Zinc	µg/L	48	> 700 µg/L
Parameters		**Monitoring Results**	**Limit Level**
May 2024			
Temperature	°C	34.3	> 43 °C

Parameters		Monitoring Results	Limit Level
pH Value	pH unit	8.3	6 – 10
Volume Discharged	m^3	1365	>2,000 m^3
Suspended Solids (SS)	mg/L	23	> 800 mg/L
Phosphate	mg/L	5.22	> 25 mg/L
Sulphate	mg/L	224	> 800 mg/L
Total Inorganic Nitrogen [a]	mg/L	36.06	> 100 mg/L
BOD	mg/L	10	> 800 mg/L
COD	mg/L	791	> 2,000 mg/L
Oil & Grease	mg/L	<5	> 20 mg/L
Boron	µg/L	3820	> 7,000 µg/L
Iron	mg/L	1.26	> 5 mg/L
Cadmium	µg/L	<1.0	> 1 µg/L
Chromium	µg/L	85	> 300 µg/L
Copper	µg/L	<10	> 1,000 µg/L
Nickel	µg/L	85	> 700 µg/L
Zinc	µg/L	63	> 700 µg/L
Parameters		**Monitoring Results**	**Limit Level**
June 2024			
Temperature	°C	31.6	> 43 °C
pH Value	pH unit	8.2	6 – 10
Volume Discharged	m^3	358	>2,000 m^3
Suspended Solids (SS)	mg/L	56.8	> 800 mg/L
Phosphate	mg/L	7.03	> 25 mg/L
Sulphate	mg/L	135	> 800 mg/L
Total Inorganic Nitrogen [a]	mg/L	53.17	> 100 mg/L
BOD	mg/L	32	> 800 mg/L
COD	mg/L	942	> 2,000 mg/L
Oil & Grease	mg/L	<5	> 20 mg/L

Parameters		Monitoring Results	Limit Level
Boron	µg/L	4960	> 7,000 µg/L
Iron	mg/L	2.06	> 5 mg/L
Cadmium	µg/L	<1.0	> 1 µg/L
Chromium	µg/L	109	> 300 µg/L
Copper	µg/L	<10	> 1,000 µg/L
Nickel	µg/L	110	> 700 µg/L
Zinc	µg/L	79	> 700 µg/L

Note:
(a) Total Inorganic Nitrogen include Ammoniacal-nitrogen, Nitrite-nitrogen and Nitrate-nitrogen.

All leachate levels and effluent quality monitoring results were below the Limit Levels in the reporting period. No action is thus required to be undertaken in accordance with the Event and Action Plan presented in **Annex F2**.

2.3.3 GROUNDWATER MONITORING

2.3.3.1 MONITORING REQUIREMENTS AND EQUIPMENT

According to the updated EM&A Manual of the Project with incorporation of the proposed updates under the Amendment Summary approved by EPD on 15 June 2020, groundwater monitoring was carried out at 14 perimeter groundwater monitoring wells (including 3 up-gradient wells and 11 down-gradient wells) (i.e. MWX-1 to MWX-14) to monitor the groundwater quality and level of the perimeter groundwater monitoring wells at monthly interval.

The Limit Levels for groundwater quality is provided in **Table 2.27** below.

TABLE 2.27 LIMIT LEVELS FOR GROUNDWATER QUALITY

Location	Limit Levels	
	Ammoniacal-nitrogen (mg L^{-1})	COD (mg L^{-1})
MWX-1	5.00	30
MWX-2	5.00	30
MWX-3	5.00	30
MWX-4	7.63	36
MWX-5	5.00	30
MWX-6	5.00	46
MWX-7	6.55	36
MWX-8	15.85	50
MWX-9	7.30	71
MWX-10	5.00	30

Location	Limit Levels	
	Ammoniacal-nitrogen (mg L^{-1})	**COD (mg L^{-1})**
MWX-11	5.00	30
MWX-12	5.00	30
MWX-13	5.00	30
MWX-14	5.00	30

A bladder pump with Teflon sampling tube and adjustable discharge rates was used for purging and taking of groundwater sample from the monitoring wells. Filtered groundwater samples were collected by connecting a disposable in-line filter system to the tubing of the sampling pump, prior to storage and analysis by ALS Technichem (HK) Pty Ltd. (HOKLAS Registration No. 066). A portable dip meter with 5mm accuracy was used for measurement of groundwater level at each well. The dip meter has an audio indicator of the water level and was checked before use.

The measurements of pH and electrical conductivity (EC) were undertaken *in situ*. *In situ* monitoring instruments in compliance with the specifications listed under Section 4.3.2 of the updated EM&A Manual were used to undertake the groundwater quality monitoring for the Project.

Details of the equipment used and the monitoring locations are summarised in **Table 2.28** and illustrated in **Figure 2.1**, respectively.

TABLE 2.28 GROUNDWATER MONITOIRNG DETAILS

Location	Frequency	Parameter		Monitoring Dates	Equipment
All groundwater monitoring wells (MWX-1 to MWX-14)	Monthly	• Water level • pH • EC • COD • BOD5 • TOC • Ammoniacal–nitrogen • Nitrate-nitrogen • Nitrite–nitrogen • TKN • TN • Sulphate • Sulphide • Carbonate • Bicarbonate • Phosphate	• Chloride • Sodium • Potassium • Calcium • Magnesium • Nickel • Manganese • Chromium • Cadmium • Copper • Lead • Iron • Zinc • Mercury • Boron	10 Apr 2024, 3, 16 May 2024, 12 Jun 2024	Horiba U-52G (S/N: AWE7D2V4)

2.3.3.2 MONITORING SCHEDULE FOR THE REPORTING MONTH

The schedule for groundwater quality monitoring during the reporting period is provided in **Annex C**.

2.3.3.3 RESULTS AND OBSERVATIONS

The groundwater quality monitoring results and detailed monitoring results are summarised in **Table 2.29** and provided in **Annex F5**, respectively.

TABLE 2.29 SUMMARY OF GROUNDWATER MONITORING RESULTS IN THE REPORTING PERIOD

	Ammoniacal-nitrogen (mg L^{-1})				COD (mg L^{-1})			
	Monitoring Results			Limit Levels	Monitoring Results			Limit Levels
	Average	Min	Max		Average	Min	Max	
MWX-1	0.31	0.14	0.49	5.00	8	6	11	30
MWX-2	0.51	0.02	1.05	5.00	11	6	21	30
MWX-3	0.63	0.05	1.44	5.00	14	10	18	30
MWX-4	1.94	0.09	5.30	7.63	17	10	26	36
MWX-5	3.16	0.19	6.59	5.00	28	13	42	30
MWX-6	4.09	3.49	4.86	5.00	46	45	47	46
MWX-7	5.21	4.66	5.59	6.55	25	12	47	36
MWX-8	13.40	10.00	15.70	15.85	43	35	49	50
MWX-9	0.19	0.01	0.54	7.30	20	18	22	71

MWX-10	0.02	0.01	0.02	5.00	7	3	10	30
MWX-11	0.05	0.03	0.08	5.00	6	4	7	30
MWX-12	0.04	0.03	0.04	5.00	3	3	3	30
MWX-13	0.03	0.02	0.03	5.00	3	3	3	30
MWX-14	0.03	0.03	0.03	5.00	2	2	2	30

Limit Level exceedances were recorded for groundwater monitoring in the reporting period and actions in accordance with the Event and Action Plan presented in **Annex F2** were undertaken. Investigation of the Limit Levels exceedances was conducted and the investigation reports are presented in **Annex F6**.

Based on the investigation conducted for the monitoring event with potential Limit Levels exceedances with the Contractor and the IEC, the groundwater (ammoniacal-nitrogen) exceedance at MWX-5 on 3 May 2024 and the groundwater (COD) exceedances at MWX-6 on 10 April 2024 and 3 May 2024, at MWX-5 on 3 May 2024 and at MWX-7 on 12 June 2024 were considered non Project-related.

The Contractor was reminded to implement all relevant mitigation measures for the construction and operation works and maintain good site practice. The ET will keep track on the monitoring data and ensure Contractor's compliance of the environmental requirements.

2.4 LANDFILL GAS MONITORING

2.4.1 MONITORING REQUIREMENTS

According to the updated EM&A Manual of the Project, landfill gas monitoring was carried out at the perimeter of the waste boundary (monitoring wells), area between the SENTX Site boundary and the waste boundary (surface emission), occupied on-site building, service voids, utilities pit and manholes in the vicinity of the SENTX (build-up of landfill gas) during the operation/restoration phase.

The Limit Levels for landfill gas monitoring is provided in **Table 2.30** below.

TABLE 2.30 LIMIT LEVELS FOR LANDFILL GAS CONSTITUENTS

Parameters	**Monitoring Location**	**Limit Level (% (v/v))**	
Perimeter Landfill Gas Monitoring Wells [a]			
Methane & Carbon Dioxide		Methane	Carbon Dioxide
	LFG1	1.0	3.2
	LFG2	1.0	4.3
	LFG3	1.0	6.3
	LFG4	1.0	7.0
	LFG5	1.0	3.4
	LFG6	1.0	9.1
	LFG7	1.0	1.5
	LFG8	12.6	2.4

Parameters	Monitoring Location	Limit Level (% (v/v))	
	LFG9	2.5	1.7
	LFG10	3.5	1.6
	LFG11	3.0	2.0
	LFG12	13.2	1.5
	LFG13	22.5	2.7
	LFG14	5.2	1.8
	LFG15	18.2	2.0
	LFG16	1.0	2.0
	LFG17	17.8	2.4
	LFG18	2.3	2.1
	LFG19	6.3	3.1
	LFG20	1.0	4.6
	LFG21	1.0	4.8
	LFG22	1.0	4.0
	LFG23	1.0	10.3
	LFG24	1.0	4.7
	GP1	1.0	10.6
	GP2 (shallow)	1.0	11.4
	GP2 (deep)	1.0	10.4
	GP3 (shallow)	1.0	6.9
	GP3 (deep)	1.0	5.6
	GP4 (shallow)	1.0	11.6
	GP4 (deep)	1.0	7.7
	GP5 (shallow)	1.0	10.8
	GP5 (deep)	1.0	7.5
	GP6	1.0	8.4
	GP7	1.0	4.5
	GP12	1.0	2.3
	GP15	1.0	2.2
	P7	1.0	2.5
	P8	1.0	1.7
	P9	1.0	2.7
Service Voids, Utilities Pits and Manholes			

Parameters	Monitoring Location	Limit Level (% (v/v))
Methane (or flammable gas)	Service voids, utilities pits and manholes	1% by volume
Permanent Gas Monitoring System		
Methane (or flammable gas)	Permanent Gas Monitoring System	1% by volume (20% LEL)
Area Between the SENTX Site Boundary and Waste Boundary (Surface Emission)		
Flammable gas	Area between SENTX site boundary and waste boundary	30 ppm

Notes:
(a) Limit Levels established based on the pre-operation phase baseline and additional landfill gas monitoring results in the Pre-operation Baseline Monitoring Report.

Gas analysers in compliance with the specifications listed under Section 5.4.1 of the updated EM&A Manual were used to monitor the gas parameters at the landfill gas monitoring wells, service voids, utilities pits and manholes. The gas analyser was calibrated by a laboratory accredited under HOKLAS at yearly intervals and checked before use to ensure the validity and accuracy of the results. A portable dip meter was used to monitor the water level in the monitoring wells.

Permanent gas monitoring systems with pre-set alarm levels for methane at 20% lower explosive limit (LEL, equivalent to 1% methane gas (v/v)) were installed and operated in all occupied on-site buildings at SENTX. A central control panel is equipped to alert site personnel when the gas concentration at any detector reaches the alarm level.

Flammable gas detector in compliance with the specifications listed under Section 5.4.1 of the updated EM&A Manual was used to measure flammable gas concentration. Flammable gas surface emission survey was conducted at a slow pace with the inlet tube of the meter probe a few centimeters above ground surface to detect flammable gas emitted from the ground surface.

Bulk gas samples were collected into inert sample containers (i.e. Tedlar Bag) and transferred to ALS Technichem (HK) Pty Ltd. (HOKLAS Registration No. 066) laboratory within 24 hours of collection for direct analysis on a gas chromatography within 48 hours after collection.

The equipment used in the landfill gas monitoring programme is summarised in **Table 2.31**. The landfill gas monitoring locations for perimeter landfill gas monitoring wells, flammable gas surface emission survey route and service voids, utilities and manholes along the Site boundary within the SENTX site are illustrated in **Figure 2.3 - 2.4** and **Annex G1**, respectively.

TABLE 2.31 LANDFILL GAS MONITORING DETAILS

Monitoring Location	Frequency	Parameter	Monitoring Dates	Equipment
Perimeter landfill gas monitoring wells (LFG1 to LFG24, P7 to P9, GP1 to GP7, GP12 and GP15)	Monthly	• Methane • Carbon dioxide • Oxygen	12 Apr 2024, 8 May 2024, 3 Jun 2024	GA5000 (S/N: G508090)

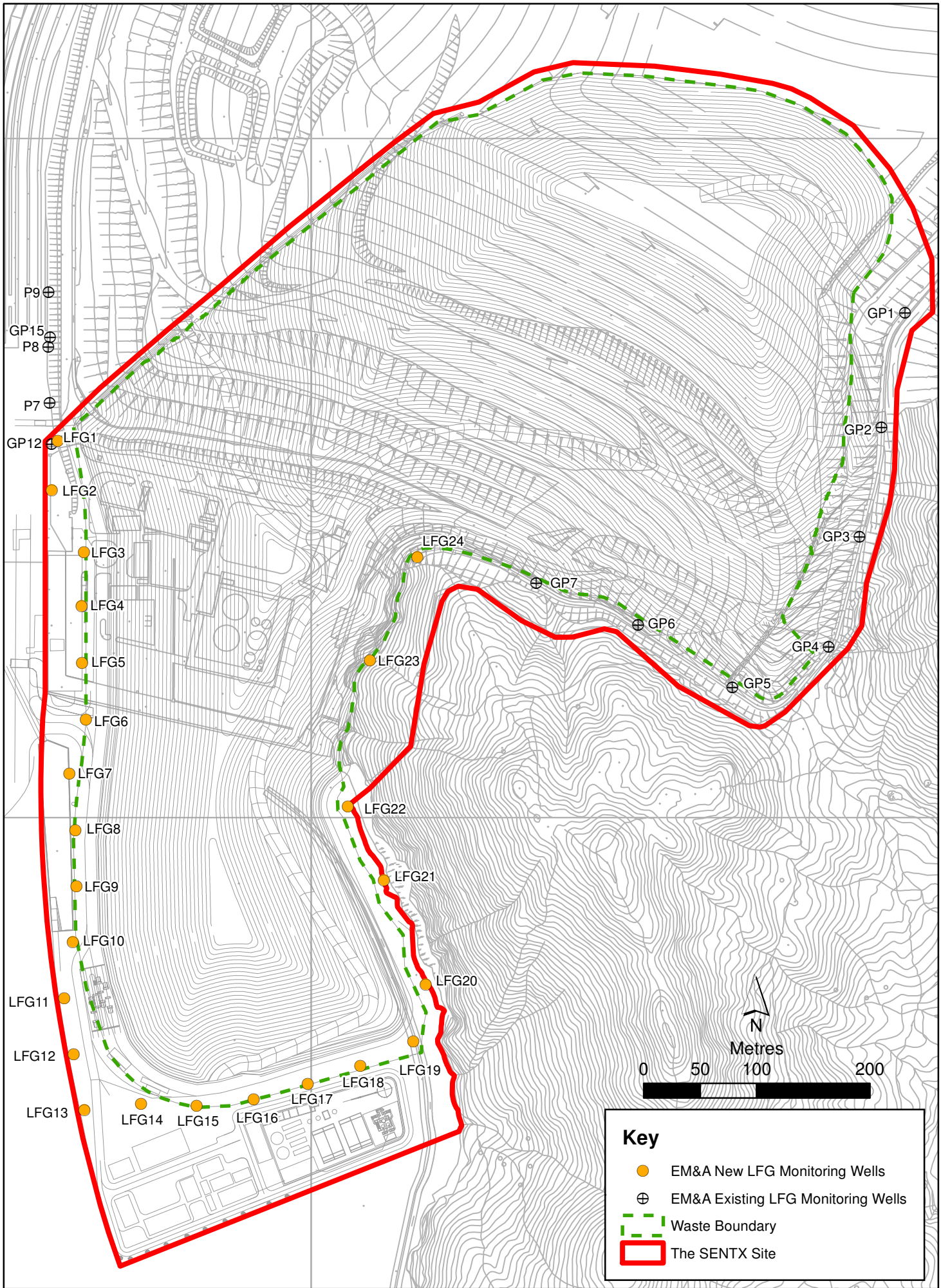


Figure 2.3

Location of Landfill Gas Monitoring Wells

File: T:\GIS\CONTRACT\0465169\mxd\0465169_Landfill_Gas_Monitoring_Wells.mxd
Date: 20/11/2019

ERM

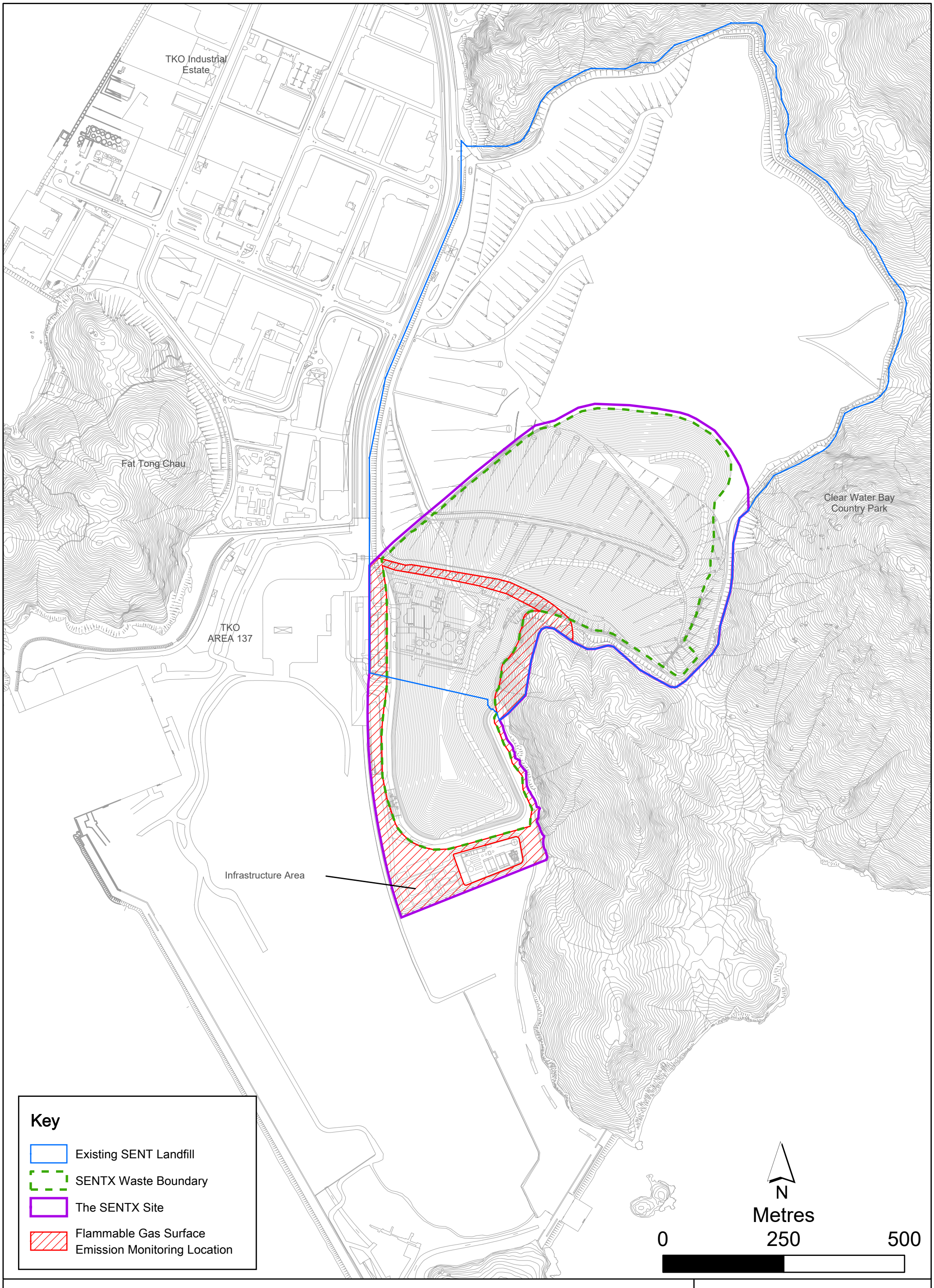


Figure 2.4

Flammable Gas Surface Emission Monitoring Locations

ERM

Monitoring Location	Frequency	Parameter	Monitoring Dates	Equipment
		• Atmospheric pressure		
Service voids, utilities and manholes along the Site boundary and within the SENTX Site (UU1 to UU28)	Monthly	• Methane • Carbon dioxide • Oxygen	12 Apr 2024, 6 May 2024, 3 Jun 2024	GA5000 (S/N: G508090)
Permanent gas monitoring system in all occupied on-site buildings	Continuous	Methane (or flammable gas) by permanent gas monitoring system	1 Apr – 30 Jun 2024	Permanent gas monitoring system
Areas between the SENTX Site boundary and the waste boundary and location of vegetation stress	Quarterly	Flammable gas emitted from the ground surface	14 May 2024	GMI Leak Surveyor (S/N: 554846)
Bulk gas sampling at least 2 of the perimeters LFG monitoring wells	Quarterly	• Methane • Carbon dioxide • Oxygen • Nitrogen • Carbon monoxide • Other flammable gas	8 May 2024	Gas sampling pump and Tedlar bags

2.4.2 MONITORING SCHEDULE FOR THE REPORTING MONTH

The schedule for landfill gas monitoring during the reporting period is provided in **Annex C**.

2.4.3 RESULTS AND OBSERVATIONS

The landfill gas monitoring results are summarised and provided in **Tables 2.32 - 2.35** and **Annex G2**, respectively.

TABLE 2.32 SUMMARY OF LANDFILL GAS MONITORING RESULTS AT PERIMETER LFG MONITORING WELLS IN THE REPORTING PERIOD

Location	Methane (% (v/v))				Carbon Dioxide (% (v/v))			
	Monitoring Results			Limit Level (a)	Monitoring Results			Limit Level (a)
	Average	Min	Max		Average	Min	Max	
LFG1	0.1	0.0	0.1	1	0.8	0.6	1.3	3.2
LFG2	0.1	0.0	0.1	1	0.9	0.4	1.6	4.3
LFG3	0.1	0.0	0.1	1	2.4	0.1	3.8	6.3
LFG4	0.1	0.0	0.1	1	0.6	0.1	1.7	7.0
LFG5	0.1	0.0	0.1	1	0.3	0.1	0.5	3.4
LFG6	0.1	0.0	0.1	1	0.3	0.2	0.4	9.1
LFG7	0.1	0.0	0.1	1	0.1	0.0	0.3	1.5

Location	Methane (% (v/v))				Carbon Dioxide (% (v/v))			
	Monitoring Results			Limit Level (a)	Monitoring Results			Limit Level (a)
	Average	Min	Max		Average	Min	Max	
LFG8	0.1	0.0	0.1	12.6	0.1	0.1	0.1	2.4
LFG9	0.3	0.0	0.9	2.5	0.2	0.1	0.3	1.7
LFG10	0.5	0.0	1.3	3.5	0.2	0.1	0.2	1.6
LFG11	0.1	0.0	0.1	3	0.1	0.0	0.1	2.0
LFG12	0.1	0.0	0.3	13.2	0.1	0.0	0.1	1.5
LFG13	5.5	0.0	16.5	22.5	0.2	0.0	0.4	2.7
LFG14	0.1	0.0	0.3	5.2	0.1	0.0	0.1	1.8
LFG15	3.8	0.0	10.8	18.2	0.4	0.1	1.0	2.0
LFG16	0.0	0.0	0.1	1	0.1	0.1	0.2	2.0
LFG17	3.6	0.0	10.8	17.8	0.8	0.2	1.8	2.4
LFG18	0.0	0.0	0.1	2.3	0.3	0.1	0.7	2.1
LFG19	0.0	0.0	0.1	6.3	0.1	0.1	0.1	3.1
LFG20	0.0	0.0	0.0	1	0.5	0.5	0.5	4.6
LFG21	0.0	0.0	0.0	1	0.1	0.1	0.1	4.8
LFG22	0.0	0.0	0.0	1	0.1	0.1	0.1	4.0
LFG23	0.0	0.0	0.0	1	0.1	0.1	0.1	10.3
LFG24	0.0	0.0	0.0	1	0.1	0.1	0.1	4.7
GP1	0.0	0.0	0.0	1	3.3	0.3	7.6	10.6
GP2 (shallow)	0.0	0.0	0.0	1	1.1	0.8	1.4	11.4
GP2 (deep)	0.0	0.0	0.0	1	0.1	0.1	0.2	10.4
GP3 (shallow)	0.0	0.0	0.0	1	0.1	0.1	0.2	6.9
GP3 (deep)	0.0	0.0	0.0	1	0.7	0.1	1.3	5.6
GP4 (shallow)	0.0	0.0	0.0	1	0.7	0.5	1.0	11.6
GP4 (deep)	0.0	0.0	0.0	1	1.6	0.2	4.2	7.7
GP5 (shallow)	0.0	0.0	0.0	1	3.8	0.4	5.5	10.8
GP5 (deep)	0.0	0.0	0.0	1	0.1	0.1	0.2	7.5
GP6	0.0	0.0	0.0	1	2.4	0.7	5.6	8.4

Location	Methane (% (v/v))				Carbon Dioxide (% (v/v))			
	Monitoring Results			Limit Level (a)	Monitoring Results			Limit Level (a)
	Average	Min	Max		Average	Min	Max	
GP7	0.0	0.0	0.0	1	0.1	0.1	0.2	4.5
GP12	0.1	0.0	0.1	1	0.5	0.1	1.3	2.3
GP15	0.1	0.0	0.1	1	0.0	0.0	0.1	2.2
P7	0.1	0.0	0.1	1	0.1	0.0	0.2	2.5
P8	0.1	0.0	0.1	1	0.1	0.1	0.2	1.7
P9	0.1	0.0	0.1	1	0.4	0.3	0.6	2.7

Notes:
(a) Limit Levels established based on the pre-operation phase baseline and additional landfill gas monitoring results in the Pre-operation Baseline Monitoring Report.

TABLE 2.33 SUMMARY OF LANDFILL GAS MONITORING RESULTS AT SERVICE VOIDS, UTILITIES PITS AND MANHOLES IN THE REPORTING PERIOD

Location	Methane (% (v/v))			
	Monitoring Results			Limit Levels
	Average	Min	Max	
UU01	0.0	0.0	0.1	1.0
UU02	0.0	0.0	0.1	1.0
UU03	0.0	0.0	0.0	1.0
UU04	0.1	0.0	0.1	1.0
UU05	0.1	0.0	0.1	1.0
UU06	0.0	0.0	0.1	1.0
UU07	0.0	0.0	0.1	1.0
UU08	0.0	0.0	0.1	1.0
UU09	0.0	0.0	0.1	1.0
UU10	0.0	0.0	0.1	1.0
UU11	0.0	0.0	0.1	1.0
UU12	Voided due to latest site programme and on-going operation work			1.0
UU13	0.0	0.0	0.1	1.0
UU14	0.0	0.0	0.1	1.0
UU15	0.0	0.0	0.1	1.0
UU16	0.0	0.0	0.1	1.0
UU17	Voided due to latest site programme and on-going operation work			1.0

Location	Methane (% (v/v))			
	Monitoring Results			Limit Levels
	Average	Min	Max	
UU18	Voided due to latest site programme and on-going operation work			1.0
UU19	Voided due to latest site programme and on-going operation work			1.0
UU20	0.0	0.0	0.1	1.0
UU21	0.0	0.0	0.1	1.0
UU22	0.0	0.0	0.1	1.0
UU23	0.0	0.0	0.1	1.0
UU24	0.0	0.0	0.1	1.0
UU25	0.0	0.0	0.1	1.0
UU26	0.0	0.0	0.1	1.0
UU27	0.0	0.0	0.1	1.0
UU28	0.0	0.0	0.1	1.0

TABLE 2.34 SUMMARY OF LANDFILL GAS BULK SAMPLING MONITORING RESULTS IN THE REPORTING PERIOD

Parameters	Limit Level (LFG2) [(a)]	LFG2	Limit Level (LFG8) [(a)]	LFG8
Methane (% (v/v))	1.0	<0.020	12.6	<0.020
Carbon Dioxide (% (v/v))	4.3	0.624	2.4	0.089
Oxygen (% (v/v))	-	19.5	-	20.1
Nitrogen (% (v/v))	-	78.3	-	78.2
Carbon Monoxide (% (v/v))	-	<0.020	-	<0.020
Hydrogen (% (v/v))	-	<0.020	-	<0.020
Ethane (ppmv)	-	<1.0	-	<1.0
Propane (ppmv)	-	<1.0	-	<1.0
Butane (ppmv)	-	<1.0	-	<1.0

Notes:
(a) Limit Levels established based on the pre-operation phase baseline and additional landfill gas monitoring results in the Pre-operation Baseline Monitoring Report

TABLE 2.35 SUMMARY OF FLAMMABLE GAS SURFACE EMISSION MONITORING RESULTS IN THE REPORTING PERIOD

GPS Coordinates Latitude (N)	Longitude (E)	Monitoring Results (ppm)	Limit Level (ppm)
22°16'34"	114°16'38"	13	30
22°16'24"	114°16'26"	16	
22°16'31"	114°16'27"	11	

The alarm of the permanent gas monitoring systems with pre-set levels for methane at 20% lower explosive limit (LEL, equivalent to 1% methane gas (v/v)) was not triggered at all occupied on-site buildings at SENTX from April 2024 to June 2024.

All the landfill gas monitoring results were below the Limit Levels in the reporting period. No action is thus required to be undertaken in accordance with the Event and Action Plan presented in **Annex G3**.

2.5 LANDSCAPE AND VISUAL MONITORING

2.5.1 MONITORING REQUIREMENTS

According to the updated EM&A Manual of the Project, the monthly landscape and visual audit was conducted on 8 April 2024, 20 May 2024 and 20 June 2024 to monitor the implementation of the landscape and visual mitigation measures during operation/ restoration phase.

All relevant environmental mitigation measures listed in the approved EIA Report and the updated EM&A Manual and their implementation status are summarized in **Annex B**.

2.5.2 RESULTS AND OBSERVATIONS

The Contractor has implemented environmental mitigation measures as stated in the approved EIA Report and the EM&A Manual.

Regarding the landscape and visual audit, the Contractor was reminded to maintain the advance screen planting works regularly to ensure effective screening of views of project works from the High Junk Peak Trail.

2.6 EM&A SITE INSPECTION

Site inspections were carried out on a weekly basis with the Contractor, IEC and EPD to monitor the implementation of proper environmental pollution control and mitigation measures under the Project. In the reporting period, 13 site inspections were carried out on 3, 11, 18 and 24 April 2024, 2, 9, 16, 23 and 30 May 2024 and 6, 13, 20 and 27 June 2024.

Key observations during the site inspections are summarised in **Table 2.36**.

TABLE 2.36 KEY OBSERVATIONS IDENTIFIED DURING THE SITE INSPECTION IN THIS REPORTING MONTH

Inspection Date	Environmental Observations and Recommendations
3 April 2024	• No observations during the site inspection.

Inspection Date	Environmental Observations and Recommendations
11 April 2024	• No observations during the site inspection.
18 April 2024	• The Contractor shall remove the deposited silt and grit accumulated at DP3 sediment pit regularly to ensure it is functioning properly at all times.
24 April 2024	• The Contractor shall remove the general refuse accumulated at X10 channel drop inlet to ensure it is functioning properly at all times. • The Contractor shall remove the deposited silt, grit and general refuse accumulated at DP4 sediment pit and outlet regularly to ensure it is functioning properly at all times. • The Contractor shall install extra silt fencing/ place sandbag at X10 channel to minimize high SS runoff to the channel. • The Contractor shall review the treatment capacity of the Wetseps at DP3, DP4 and DP6 to ensure all surface water it is treated before discharge.
2 May 2024	• The Contractor shall remove the deposited silt and grit accumulated at X10 channel regularly to ensure it is functioning properly at all times. • The Contractor shall adjust the pH of Wetsep 2 at DP4 to ensure all surface water is treated within pH 6-9 before discharge.
9 May 2024	• The Contractor shall repair the silt fencing at X10 channel near Pump House No.3 to minimize SS runoff to the channel.
16 May 2024	• The Contractor shall remove the general refuse accumulated at DP3 to prevent general refuse drops into sediment trap.
23 May 2024	• The Contractor shall review Wetsep treatment efficiency at DP3 to prevent non-compliance with the WPCO standard and EM&A requirement. • The Contractor shall repair the silt fencing at X10 channel near Pump House No.3 to minimize SS runoff to the channel. • The Contractor shall remove the deposited silt and grit accumulated at X10 channel regularly to ensure it is functioning properly at all times. • The Contractor remove the stagnant water and chemicals in the drip trays of Wetseps near DP4 and handle the clean-up materials as chemical waste.
30 May 2024	• The Contractor shall remove the deposited silt and grit accumulated at X10 channel regularly to ensure it is functioning properly at all times.
6 June 2024	• The Contractor shall review Wetsep treatment efficiency at DP4 to prevent non-compliance with the WPCO standard and EM&A requirement. • The Contractor shall remove the stagnant water and chemicals in the drip trays of Wetseps near DP4 and handle the clean-up materials as chemical waste.
13 June 2024	• The Contractor shall remove the general refuse accumulated at DP4 sediment pit regularly to ensure it is functioning properly at all times. • The Contractor shall review the treatment capacity of the Wetseps at DP3, DP4 and DP6 to ensure all surface water it is treated before discharge.

Inspection Date	Environmental Observations and Recommendations
20 June 2024	• The Contractor shall remove the deposited silt and grit accumulated at X10 channel regularly to ensure it is functioning properly at all times. • The Contractor shall remove the general refuse, deposited silt and grit accumulated at DP4 sediment pit regularly to ensure it is functioning properly at all times. • The Contractor shall remove the stagnant water and chemicals in the drip trays of Wetseps near DP4 and handle the cleanup materials as chemical waste. • The Contractor shall repair the silt fencing along DP6 channel to minimize SS runoff to the channel.
27 June 2024	• The Contractor shall remove the deposited silt and grit accumulated at DP3 sediment pit regularly to ensure it is functioning properly at all times. • The Contractor shall remove the deposited silt and grit accumulated at X10 channel and repair the silt fencing along X10 channel to minimize SS runoff to channel. • The Contractor remove the deposited silt and grit accumulated at DP4 sediment pit regularly to ensure it is functioning properly at all times. • The Contractor shall review the treatment capacity of the Wetseps at DP3 and DP4 to ensure all surface water it is treated before discharge.

The Contractor has rectified all observations identified during environmental site inspections in the reporting period. Key environmental deficiencies identified and the corresponding rectification actions are presented in **Table 2.37**.

TABLE 2.37 SUMMARY OF ENVIRONMENTAL DEFICIENCIES IDENTIFIED AND CORRESPONDING RECTIFICATION ACTIONS

Deficiencies	Rectifications Implemented	Proposed Additional Control Measures
Surface Water		
Intercepting channels & drainage system	• Reviewed drainage plan.	• Addition of channels. • Expedite the construction of permanent sediment trap and discharge culverts.
DP channels (design & regular silt removal)	• Carried out regular maintenance and cleaning of channels. • DP4 channel: Area near the channel was paved with concrete and a bund was built. • DP6 channel: Gravel piles on the channel were covered with concrete which serve as blocks for running water and to divide the channel into several sections. A pump was	N.A.

Deficiencies	Rectifications Implemented	Proposed Additional Control Measures
	placed in the water zone in the upstream section to pump water to the Wetsep for treatment prior to the discharge to the last section before the weir plate. • DP6: Pipes through the gravel piles between different channel sections were covered with geotextiles to block debris and silt.	
Stockpiles & exposed soil	• Installed silt fencing near surface water channel along DP6 channel.	• Improve soil covering. • Compaction and cover for stockpiles and soil slopes.
Wetsep (treatment capacity & number)	• Reviewed Wetsep capacity. • Chemicals dosage of the Wetsep was increased to enhance the efficiency.	• Install additional Wetsep.
Backflow / ponding during heavy rainfall	• Raised with EPD (LDG) and CEDD.	N.A.

2.7 WASTE MANAGEMENT STATUS

The Contractor has registered as chemical waste producer under the Contract. Sufficient numbers of receptacles were available for general refuse collection and sorting.

As informed by the Contractor, waste generated during this reporting period include mainly chemical waste. Reference has been made to the waste flow table prepared by the Contractor. The quantities of different types of wastes and imported fill materials are summarized in **Table 2.38**.

TABLE 2.38 QUANTITIES OF DIFFERENT WASTE GENERATED AND IMPORTED FILL MATERIALS

Month /Year	Inert C&D Materials [a] (in '000m³)	Imported Fill (in '000kg) [b]		Inert Construction Waste Re-used (in '000m³)	Non-inert Construction Waste [c] (in '000m³)	Recyclable Materials [d] (in '000kg)	Yard Waste (in '000kg)		Chemical Wastes (in '000kg)
		Rock	Soil				Y Park	SENT	
1 – 30 Apr 24	0	0	0	0	0	0.28	3.23	0	0.91
1 – 31 May 24	0	0	0	0	0	0	0	0	0.80
1 – 30 Jun 24	0	0	0	0	0	0.25	0	0	0.80

Notes:

(a) Inert construction wastes include hard rock and large broken concrete, and materials disposed as public fill. Density assumption: 1.6 (kg/L) for public fill.
(b) Imported fill refers to materials generated from other project for on-site reuse.
(c) Non-inert construction wastes include general refuse disposed at landfill. Density assumption: 0.9 (kg/L) for general refuse.
(d) Recyclable materials include metals, paper, cardboard, plastics and others.

2.8 IMPLEMENTATION STATUS OF ENVIRONMENTAL MITIGATION MEASURES

A summary of the Environmental Mitigation Implementation Schedule is presented in **Annex B**. The necessary mitigation measures were implemented properly for the Project.

2.9 SUMMARY OF EXCEEDANCES OF THE ENVIRONMENTAL QUALITY PERFORMANCE LIMIT

The operation/ restoration phase noise and landfill gas monitoring results complied with the Action and Limit Levels in the reporting period.

Two exceedances of Limit Levels for landfill gas flare stack emission (Benzene) and one exceedance of Limit Levels for landfill gas flare stack emission (CO) were recorded for air quality monitoring in the reporting period. The landfill gas flare stack emission (Benzene and CO) exceedances on 18 April 2024 and landfill gas flare stack emission (Benzene) exceedance on 9 May 2024 were considered Project-related upon further investigation.

Two exceedances of the Limit Levels for surface water (Suspended Solids (SS)), one exceedance of the Limit Levels for surface water (ammoniacal-nitrogen), one exceedance of the Limit Levels for groundwater (ammoniacal-nitrogen) and four exceedances of the Limit Levels for groundwater (COD) were recorded were recorded for water quality impact monitoring in the reporting period. The surface water (Ammoniacal-nitrogen) exceedance at DP3 and the surface water (SS) exceedances at DP6 on 6 May 2024 and at DP4 on 12 June 2024 were considered Project-related upon further investigation. The groundwater (ammoniacal-nitrogen) exceedance at MWX-5 on 3 May 2024 and the groundwater (COD) exceedances at MWX-6 on 10 April 2024 and 3 May 2024, at MWX-5 on 3 May 2024 and at MWX-7 on 12 June 2024 were considered non Project-related upon further investigation.

Cumulative statistics on exceedances is provided in **Annex H**.

2.10 SUMMARY OF COMPLAINTS, NOTIFICATION OF SUMMONS AND SUCCESSFUL PROSECUTIONS

There were no complaints, notification of summons or prosecution recorded in the reporting period.

Statistics on complaints, notifications of summons, successful prosecutions are summarised in **Annex H**.

3. CONCLUSION AND RECOMMENDATIONS

This Quarterly EM&A Report presents the findings of the EM&A activities undertaken during the period from 1 April 2024 to 30 June 2024 in accordance with the updated EM&A Manual and the requirements of the Environmental Permit (*EP-308/2008/C)*.

Air quality (24-hour TSP, odour, thermal oxidiser, landfill gas flare and landfill gas generator stack emission, ambient VOCs, ammonia and H_2S), noise, water quality (surface water, leachate and groundwater) and landfill gas monitoring were carried out in the reporting period. Results for noise and landfill gas monitoring complied with the Action and Limit Levels in the reporting period.

Two exceedances of Limit Levels for landfill gas flare stack emission (Benzene), one exceedance of Limit Levels for landfill gas flare stack emission (CO), two exceedances of the Limit Levels for surface water (Suspended Solids (SS)), one exceedance of the Limit Levels for surface water (ammoniacal-nitrogen), one exceedance of the Limit Levels for groundwater (ammoniacal-nitrogen) and four exceedances of the Limit Levels for groundwater (COD) were recorded in the reporting period.

Thirteen environmental site inspections were carried out during the reporting period. Environmental deficiencies were identified during the site inspection and the Contractor has proposed additional control measures to rectify the deficiencies.

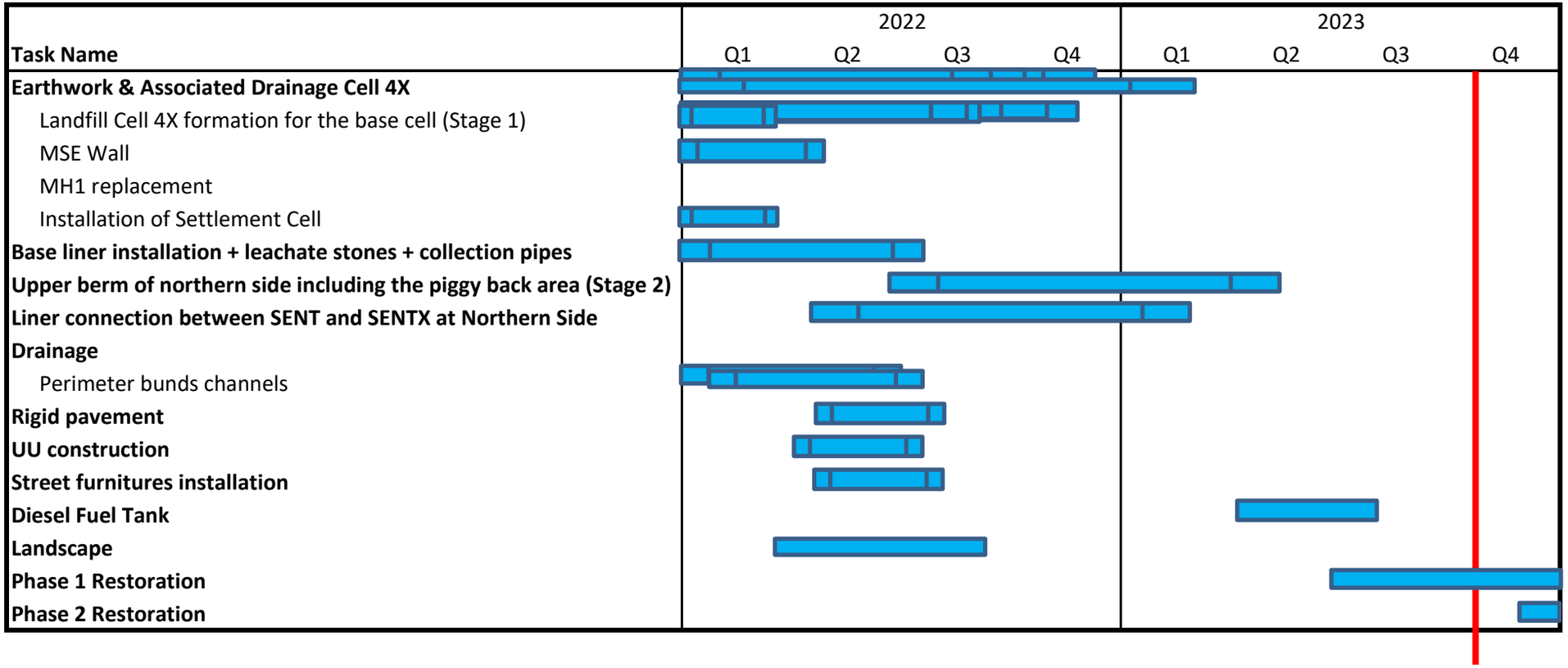
There were no complaints, notification of summons or prosecution recorded in the reporting period.

It is noted that most environmental pollution control and mitigation measures were properly implemented and the construction and operation activities of the Project did not introduce any adverse impact to the sensitive receivers in the reporting period. Yet, some environmental deficiencies were identified during the reporting period and additional control measures have been proposed by the Contractor to rectify the corresponding deficiencies. The monitoring programme has been reviewed and was considered as adequate to cater for the nature of works in progress. Change to the monitoring programme was thus not recommended at this stage. The monitoring programme will be evaluated as appropriate in the next reporting period. The ET will keep track on the construction works to confirm compliance of environmental requirements and the proper implementation of all necessary mitigation measures.

ANNEX A WORK PROGRAMME

SENT Landfill Extension (SENTX) - Construction Programme for Cell 4X

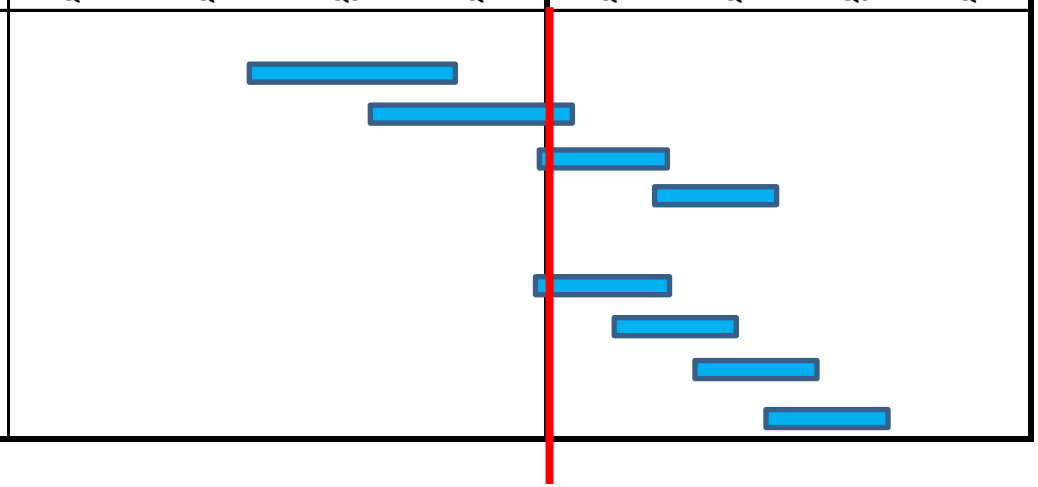
Update 1 November 2023



SENTX - Construction Programme

Update 1st January 2024

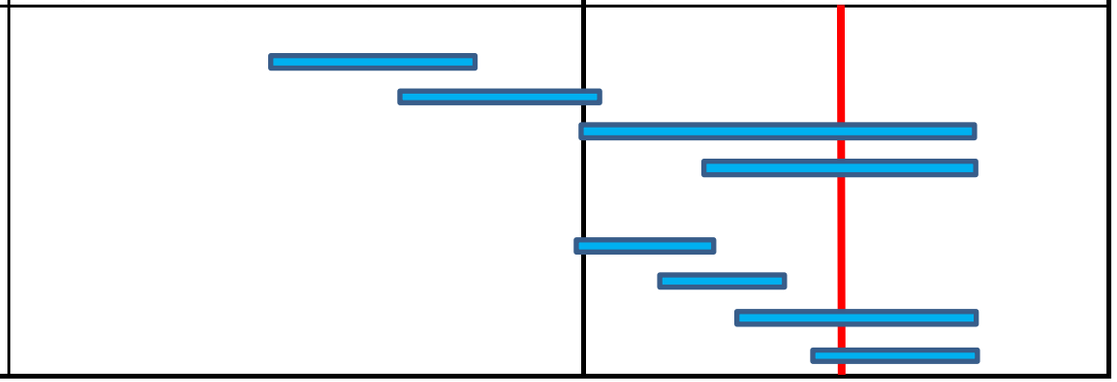
Task Name	2023 Q1	2023 Q2	2023 Q3	2023 Q4	2024 Q1	2024 Q2	2024 Q3	2024 Q4
Phase 1 Restoration								
Subgrade soil + Liner								
Cover Soil								
Above Cap Gas pipe + Drainage								
Landscape								
Phase 2 Restoration								
Subgrade soil + Liner								
Cover Soil								
Above Cap Gas pipe + Drainage								
Landscape								



SENTX - Construction Programme

Update 31st May 2024

Task Name	2023 Q1	2023 Q2	2023 Q3	2023 Q4	2024 Q1	2024 Q2	2024 Q3	2024 Q4
Phase 1 Restoration								
Subgrade soil + Liner								
Cover Soil								
Above Cap Gas pipe + Drainage								
Landscape								
Phase 2 Restoration								
Subgrade soil + Liner								
Cover Soil								
Above Cap Gas pipe + Drainage								
Landscape								



ANNEX B ENVIRONMENTAL MITIGATION IMPLEMENTATION SCHEDULE

ANNEX B ENVIRONMENTAL MITIGATION IMPLEMENTATION SCHEDULE

EIA Ref.	EM&A Ref	Environmental Protection Measures/ Mitigation Measures	Objectives of the Recommended Measure & Main Concerns to address	Location of the Measures	Who to implement the measure?	When to implement the measure? (1)				What requirements or standards for the measure to achieve?	Implementation Status and Remarks
						D	C	O/R	A		
Air Quality – Construction Phase											
4.8.1	AQ1	<u>Blasting</u> • The area within 30m of the blasting area will be wetted prior to blasting. • Blasting will not be carried out when the strong wind signal or tropical cyclone warning signal No. 3 or higher is hoisted, unless this is with the express prior permission of the Commissioner of Mines. • loose material and stones in the Site will be removed prior to the blast operation • During blasting, blast nets, screens and other protective covers will be used to prevent the projection of flying	To minimise potential dust nuisance	Blasting area and 30m of blasting area	SENTX Contractor		✓			*Air Pollution Control (Construction Dust) Regulations*	Not applicable. Blasting is not required in the latest landfill design

(1) D=Design; C=Construction; O/R=Operation/Restoration; A=Aftercare

EIA Ref.	EM&A Ref	Environmental Protection Measures/ Mitigation Measures	Objectives of the Recommended Measure & Main Concerns to address	Location of the Measures	Who to implement the measure?	When to implement the measure? (1)				What requirements or standards for the measure to achieve?	Implementation Status and Remarks
						D	C	O/R	A		
		fragments and material resulting from blasting									
4.8.1	AQ2	<u>Rock Drilling</u> Watering will be carried out at the rock drilling activities to avoid fugitive dust emissions.	To minimise potential dust nuisance	Rock drilling area	SENTX Contractor		✓			*Air Pollution Control (Construction Dust) Regulations*	Not applicable. Rock drilling is not required in the latest landfill design
4.8.1	AQ3	<u>Site Access Road</u> • The main haul road will be kept clear of dusty materials or sprayed with water. • The main haul road will be paved with aggregate or gravel. • Vehicle speed will be limited to 10kph.	To minimise potential dust nuisance	Main haul road	SENTX Contractor		✓			*Air Pollution Control (Construction Dust) Regulations* *HKAQO and EIAO-TM Annex 4*	Implemented
4.8.1	AQ4	<u>Stockpiling of Dusty Materials</u> • Any stockpile of dusty materials will be covered entirely by impervious sheeting or placed in an area sheltered on the top and three sides or sprayed	To minimise potential dust nuisance	All construction works area	SENTX Contractor		✓			*Air Pollution Control (Construction Dust) Regulations*	Implemented

EIA Ref.	EM&A Ref	Environmental Protection Measures/ Mitigation Measures	Objectives of the Recommended Measure & Main Concerns to address	Location of the Measures	Who to implement the measure?	When to implement the measure? (1)				What requirements or standards for the measure to achieve?	Implementation Status and Remarks
						D	C	O/R	A		
		with water so as to ensure that the entire surface is wet.								*HKAQO and EIAO-TM Annex 4*	
4.8.1	AQ5	<u>Loading, unloading or transfer of dusty materials</u> • All dusty materials will be sprayed with water immediately prior to any loading, unloading or transfer operation so as to maintain the dusty material wet.	To minimise potential dust nuisance	All construction works area	SENTX Contractor		✓			*Air Pollution Control (Construction Dust) Regulations* *HKAQO and EIAO-TM Annex 4*	Implemented
4.8.1	AQ6	<u>Site Boundary and Entrance</u> • Where a site boundary adjoins a road, street, service lane or other area accessible to the public, hoarding of height not less than 2.4m from ground level will be provided along the entire length of that portion of the site boundary except for the site entrance or exit.	To minimise potential dust nuisance	Site boundary and entrance	SENTX Contractor		✓			*Air Pollution Control (Construction Dust) Regulations* *HKAQO and EIAO-TM Annex 4*	Not applicable

EIA Ref.	EM&A Ref	Environmental Protection Measures/ Mitigation Measures	Objectives of the Recommended Measure & Main Concerns to address	Location of the Measures	Who to implement the measure?	When to implement the measure? (1)				What requirements or standards for the measure to achieve?	Implementation Status and Remarks
						D	C	O/R	A		
4.8.1	AQ7	<u>Excavation Works</u> • Working area of any excavation or earth moving operation will be sprayed with water immediately before, during and immediately after the operation so as to ensure that the entire surface is wet.	To minimise potential dust nuisance	All construction works area	SENTX Contractor		✓			*Air Pollution Control (Construction Dust) Regulations* *HKAQO and EIAO-TM Annex 4*	Implemented
4.8.1	AQ8	<u>Building Demolition</u> • The area where the demolition works are planned to take place will be sprayed with water immediately prior to, during and immediately after the demolition activities. • Any dusty materials remaining after a stockpile is removed will be wetted with water and cleared from the surface of roads or street.	To minimise potential dust nuisance	All construction works area	SENTX Contractor		✓			*Air Pollution Control (Construction Dust) Regulations* *HKAQO and EIAO-TM Annex 4*	Implemented

EIA Ref.	EM&A Ref	Environmental Protection Measures/ Mitigation Measures	Objectives of the Recommended Measure & Main Concerns to address	Location of the Measures	Who to implement the measure?	When to implement the measure? (1)				What requirements or standards for the measure to achieve?	Implementation Status and Remarks
						D	C	O/R	A		
4.8.1	AQ9	<u>Construction of the Superstructure of Building</u> • Effective dust screens, sheeting or netting will be provided to enclose the scaffolding from the ground level up to the highest level of the scaffolding.	To minimise potential dust nuisance	All construction works area	SENTX Contractor		✓			*Air Pollution Control (Construction Dust) Regulations* *HKAQO and EIAO-TM Annex 4*	Implemented
4.8.1	AQ10	Should a stone crushing plant be needed on site, the control measures recommended in the *Best Practicable Means Requirement for Mineral Works (Stone Crushing Plants) BPM 11/1* should be implemented.	To minimise potential dust nuisance	Stone crushing plant/ construction phase	SENTX Contractor		✓			*Best Practicable Means Requirement for Mineral Works (Stone Crushing Plants) BPM 11/1*	Not applicable. Stone crushing plant is not required in the latest landfill design
4.8.1	AQ11	Good site practices such as regular maintenance and checking of the diesel powered mechanical equipment will be adopted to avoid any black smoke emissions and to minimize	To minimise potential dust nuisance	All construction works area	SENTX Contractor		✓			*HKAQO and EIAO-TM Annex 4*	Implemented

EIA Ref.	EM&A Ref	Environmental Protection Measures/ Mitigation Measures	Objectives of the Recommended Measure & Main Concerns to address	Location of the Measures	Who to implement the measure?	When to implement the measure? (1)				What requirements or standards for the measure to achieve?	Implementation Status and Remarks
						D	C	O/R	A		
		gaseous emissions.									
4.10.1	AQ12	Dust monitoring once every 6 days	Ensure the dust generated from the project meets the air quality requirement	At monitoring locations shown in *Figure 3.2a*	SENTX Contractor		✓			*HKAQO and EIAO-TM Annex 4*	Implemented
Air Quality – Operation, Restoration and Aftercare Phases											
4.8.2	AQ13	<u>Odour</u> • Enclosing the weighbridge area	To minimise odour nuisance	Weighbridge area	SENTX Contractor	✓		✓		*EIAO-TM Annex 4*	Not Applicable. As SENTX will receive construction waste only which is significantly less odorous, enclosing the weighbridge area is not necessary
4.8.2	AQ14	• Providing a vehicle washing facility before the exit of SENTX and providing sufficient signage to remind RCV drivers to pass through the facility before leaving SENTX	To minimise odour nuisance	Vehicle washing facility	SENTX Contractor	✓		✓		*EIAO-TM Annex 4*	Implemented
4.8.2	AQ15	• Reminding the RCV drivers to empty the liquor collection sump and close the valve before leaving	To minimise odour nuisance	Tipping face	SENTX Contractor			✓		*EIAO-TM Annex 4*	Not Applicable. As SENTX will receive construction waste only, which

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						D	C	O/R	A		
		the tipping face									is relatively dry, the amount of liquor generated is expected to minimal
4.8.2	AQ16	• Washing down the area where spillage of RCV liquor is discovered promptly	To minimise odour nuisance	SENTX Site	SENTX Contractor			✓		*EIAO-TM Annex 4*	Not Applicable. As SENTX will receive construction waste only, which is relatively dry, the amount of liquor generated is expected to minimal.
4.8.2	AQ17	• Reminding operators to properly maintain their RCVs and ensure that liquor does not leak from the vehicles	To minimise odour nuisance	SENTX Site	SENTX Contractor			✓		*EIAO-TM Annex 4*	Not Applicable. As SENTX will receive construction waste only, which is relatively dry, the amount of liquor generated is expected to minimal.
4.8.2	AQ18	• Installation of landfill gas control system to enhance collection of landfill gas from the waste mass and hence minimise odour associated with fugitive landfill gas emissions	To minimise odour nuisance	SENTX Site	SENTX Contractor	✓		✓	✓	*EIAO-TM Annex 4*	Implemented

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						D	C	O/R	A		
4.8.2	AQ19	• Progressive restoration of the areas which reach the finished profile (a final capping system including an impermeable liner will be put in place) and installation of a permanent landfill gas extraction system	To minimise odour nuisance	SENTX Site	SENTX Contractor	✓		✓	✓	*EIAO-TM Annex 4*	Implemented
4.8.2	AQ20	• Installing deodorizers along the site boundary adjacent to the ASRs	To minimise odour nuisance	SENTX Site boundary	SENTX Contractor			✓	✓	*EIAO-TM Annex 4*	Not Applicable. As SENTX will receive construction waste only which is significantly less odorous, installation of deodorizers is not necessary.
4.8.2	AQ21	• Erecting a vertical barrier, wall or structure softened by planting rows of trees/shrubs or landscape feature along the site boundary, particularly in the areas near the ASRs	To minimise odour nuisance	SENTX Site boundary	SENTX Contractor	✓		✓	✓	*EIAO-TM Annex 4*	Implemented
4.8.2 and SENTX latest design	AQ22	• Maintaining the size of the active tipping face not greater than 1,200 m^2	To minimise odour nuisance	Active tipping face	SENTX Contractor			✓		*EIAO-TM Annex 4*	Implemented

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						D	C	O/R	A		
4.8.2	AQ23	• Promptly covering the MSW with soil or selected inert materials to control odour emissions	To minimise odour nuisance	Active tipping face	SENTX Contractor			✓		*EIAO-TM Annex 4*	Not Applicable. SENTX will not receive MSW.
4.8.2	AQ24	• Maintaining the size of the special waste trench not greater than 6m (l) × 2.5m (w)	To minimise odour nuisance	Special waste trench	SENTX Contractor			✓		*EIAO-TM Annex 4*	Not Applicable. SENTX will not have any special waste trench.
4.8.2 and SENTX latest design	AQ25	• Covering daily covered area with a tarpaulin sheet or 300mm of soil after the landfill operating hours	To minimise odour nuisance	Daily covered area	SENTX Contractor			✓		*EIAO-TM Annex 4*	Implemented
4.8.2	AQ26	• Covering special waste trench with 600 mm of soil and an impervious liner after 5 pm	To minimise odour nuisance	Special waste trench	SENTX Contractor			✓		*EIAO-TM Annex 4*	Not Applicable. SENTX will not have any special waste trench.
4.8.2	AQ27	• Covering the non-active tipping face with 600mm of soil and an impermeable liner (on top of the intermediate cover), which will not only control odour emissions from landfilled waste but also enhance landfill gas extraction by the landfill gas extraction system	To minimise odour nuisance	Intermediate cover	SENTX Contractor			✓		*EIAO-TM Annex 4*	Implemented

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						D	C	O/R	A		
4.8.2	AQ28	• Applying deodorizers or odour suppression agents to control odour emissions from the active tipping face and special waste trench, if any, through spraying or fogging equipment	To minimise odour nuisance	Active tipping face and special waste trench	SENTX Contractor			✓		*EIAO-TM Annex 4*	Not Applicable. As SENTX will receive construction waste only which is significantly less odorous, installation of deodorizers is not necessary. Moreover, SENTX will not have any special waste trench.
4.8.2	AQ29	• Providing a mobile cover with retractable or suitable opening to cover up the opening of the special waste trench except during waste deposition and a suitable odour removal unit. The mobile cover should be equipped with powered extraction and suitable odour removal unit for purifying the trapped gas inside the trench before release into the atmosphere	To minimise odour nuisance	Special waste trench	SENTX Contractor			✓		*EIAO-TM Annex 4*	Not Applicable. SENTX will not have any special waste trench.

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						D	C	O/R	A		
4.8.2 and SENTX latest design	AQ30	• Providing a thermal oxidizer for the leachate treatment plant	To minimise odour nuisance as a result of breakdown of thermal oxidizer	Leachate treatment plant	SENTX Contractor	✓		✓	✓	*EIAO-TM Annex 4*	Implemented
4.8.2 and SENTX latest design	AQ31	• Enclosing all the leachate storage and treatment tanks (except for the Sequential Batch Reactor (SBR) or Membrane Bioreactor (MBR) tanks) and diverting the exhaust air from these tanks to a thermal oxidizer or flare to avoid potential odour emissions from the LTP	To minimise odour nuisance	Leachate treatment plant	SENTX Contractor	✓		✓	✓	*EIAO-TM Annex 4*	Implemented
4.8.2	AQ32	• Rescheduling of waste filling activities on-site by avoiding waste filling activities carrying out at the northern area of the site in the summer months between July to November	To minimise odour nuisance	SENTX Site	SENTX Contractor			✓		*EIAO-TM Annex 4*	Not Applicable. As SENTX will receive construction waste only which is significantly less odorous, rescheduling of waste filling activities is not necessary.
4.8.2 and SENTX latest design	AQ33	Dust, Gaseous Emission and LFG including Volatile Organic Compounds (VOCs)	To minimise dust nuisance	SENTX Site	SENTX Contractor			✓		*HKAQO and EIAO-TM Annex 4*	Implemented

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						D	C	O/R	A		
		• Keeping the main haul road to the waste filling area wet by regular watering;									
4.8.2	AQ34	• Compacting the exposed daily and intermediate covered areas well to avoid fugitive dust emission;	To minimise dust nuisance	SENTX Site	SENTX Contractor			✓		*HKAQO and EIAO-TM Annex 4*	Implemented
4.8.2	AQ35	• Limiting the vehicle speed within SENTX site boundary;	To minimise dust nuisance	SENTX Site	SENTX Contractor			✓		*HKAQO and EIAO-TM Annex 4*	Implemented
4.8.2	AQ36	• Providing vehicle washing bay to avoid vehicles carrying dust to public roads;	To minimise dust nuisance	SENTX Site	SENTX Contractor			✓		*HKAQO and EIAO-TM Annex 4*	Implemented
4.8.2	AQ37	• Switching off the engine when the diesel-driven equipment is idling;	To minimise gaseous emissions	SENTX Site	SENTX Contractor			✓	✓	-	Implemented
4.8.2	AQ38	• Maintaining the construction equipment properly to avoid any black smoke emissions;	To minimise gaseous emissions	SENTX Site	SENTX Contractor			✓	✓	-	Implemented
4.8.2	AQ39	• Providing sufficient underground landfill gas collection system to capture the landfill gas	To minimise gaseous emissions,	SENTX Site	SENTX Contractor			✓	✓	*EIAO-TM Annex 4*	Implemented

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						D	C	O/R	A		
		generated as much as possible; and	including LFG and VOCs								
4.8.2	AQ40	• Periodic inspections of the final cover should be undertaken to ensure that the capping layer is in good conditions at all times.	To minimise gaseous emissions, including LFG and VOCs	SENTX Site	SENTX Contractor			✓	✓	*EIAO-TM Annex 4*	Implemented
4.10.2	AQ41	• Monitoring of ambient TSP once every 6 days	Ensure the dust emission from the project meets the dust requirement	At monitoring locations shown in *Figure 11.3a*	SENTX Contractor		✓	✓		*HKAQO* and *EIAO-TM Annex 4*	Implemented
4.10.2	AQ42	• Monitoring of ambient VOCs, ammonia and H_2S, quarterly	Ensure the gaseous emission from the project meets the air quality requirement	At monitoring locations shown in *Figure 11.3a*	SENTX Contractor			✓	✓	Odour thresholds or 1% of Occupational Exposure Limit (OEL) as stipulated in the "*UK Health and Safety Executive (HSE) EH 40/05 Occupational Exposure Limits*", whichever is lower.	Implemented

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						D	C	O/R	A		
4.10.2 and SENTX latest design	AQ43	• Monitoring of parameters for thermal oxidizer, flares and generator in accordance with requirements stated in Tables 3.4a, 3.5a and 3.6a of the EM&A Manual respectively.	Ensure the gaseous emission from the project meets the air quality requirement	At the flares and thermal oxidizer stacks when they are in operation	SENTX Contractor			✓	✓ (2)	Emission Limits specified in Contract	Implemented
4.10.2	AQ44	• To confirm design assumption of ammonia, it is recommended that the ammonia concentration in the flue gas of the thermal oxidiser be monitored during the commissioning stage of the thermal oxidiser. If required, an emission standard will be set for ammonia for the thermal oxidiser based on the monitoring results. If no ammonia is detected in the flue gas during the decommissioning stage, the monitoring of ammonia in the flue gas	Ensure the gaseous emission from the project meets the air quality requirement	At the thermal oxidizer stack during commissioning. If ammonia is detected during commissioning stage, the monitoring will continue.	SENTX Contractor			✓		Emission Limits determined during commissioning stage	Implemented

(2) For LFG flare and LFG generator only.

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						D	C	O/R	A		
		of the thermal oxidiser could be discontinued.									
4.10.2 and SENTX latest design	AQ45	• Odour patrol in accordance with requirements stated in Table 3.7a of the EM&A Manual.	Ensure the odour emission from the project meets the odour requirement	Along SENTX Site boundary	SENTX Contractor			✓		*EIAO-TM Annex 4*	Implemented
4.10.2	AQ46	• Monitoring of meteorological station, continuously	Collect site specific meteorological data	At meteorological station shown in *Figure 11.3a*	SENTX Contractor		✓	✓	✓	-	Implemented
Noise – Construction Phase											
5.7.1	N1	Adopt good site practice listed below: • Only well-maintained plant will be operated on-site and plant should be serviced regularly during the construction program; • Silencers or mufflers on construction equipment should be utilized and will be properly maintained during the construction program; • Mobile plant, if any, will be sited as far from NSRs as	To minimise potential construction noise nuisance.	All construction works area	SENTX Contractor		✓			*Noise Control Ordinance (NCO) and EIAO-TM Annex 5*	Implemented

EIA Ref.	EM&A Ref	Environmental Protection Measures/ Mitigation Measures	Objectives of the Recommended Measure & Main Concerns to address	Location of the Measures	Who to implement the measure?	When to implement the measure? (1)				What requirements or standards for the measure to achieve?	Implementation Status and Remarks
						D	C	O/R	A		
		possible; • Machines and plant (such as trucks) that may be in intermittent use will be shut down between work periods or should be throttled down to a minimum; • Plant known to emit noise strongly in one direction will, wherever possible, be orientated so that the noise is directed away from the nearby NSRs; and • Material stockpiles and other structures will be effectively utilised, wherever practicable, in screening noise from on-site construction activities.									
5.8	N2	Weekly noise monitoring	Ensure noise generated from the project meets the criteria	At monitoring locations shown in *Figure 6.4a*	SENTX Contractor		✓			*Noise Control Ordinance (NCO) and EIAO-TM Annex 5*	Implemented

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						D	C	O/R	A		
Noise – Operation/Restoration Phase											
5.7.2	N3	Adopt good site practice listed below: • Choose quieter PME;	To minimise potential operational noise nuisance.	Within the SENTX Site	SENTX Contractor			✓		*Noise Control Ordinance (NCO) and EIAO-TM Annex 5*	Implemented
		• Include noise levels specification when ordering new plant items;								-	Implemented
		• Locate fixed plant items or noise emission points away from the NSRs as far as practicable;								-	Implemented
		• Locate noisy machines in completely enclosed plant rooms or buildings; and								-	Implemented
		• Develop and implement a regularly scheduled plant maintenance programme so that plant items are properly operated and serviced. The programme should be implemented by properly trained personnel.								-	Implemented
5.8	N4	Weekly noise monitoring	Ensure noise generated from the project	At monitoring locations	SENTX Contractor			✓		*Noise Control Ordinance (NCO) and*	Implemented

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						D	C	O/R	A		
			meets the criteria	shown in *Figure 6.4a*						*EIAO-TM Annex 5*	
Water Quality – Construction Phase											
6.8.1	WQ1	<u>Construction Runoff</u> • Exposed soil areas will be minimised to reduce the contamination of runoff and erosion.	To minimise potential water quality impacts arising from the construction works	All construction works area	SENTX Contractor		✓			*ProPECC PN 1/94* *EIAO-TM Annex 6*	Implemented
6.8.1	WQ2	• Perimeter channels will be constructed in advance of site formation works and earthworks and intercepting channels will be provided for example along the edge of excavation.	To minimise potential water quality impacts arising from the construction works	All construction works area	SENTX Contractor	✓	✓			*ProPECC PN 1/94* *Water Pollution Control Ordinance (WPCO)* *EIAO-TM Annex 6*	Implemented
6.8.1	WQ3	• Silt removal facilities, channels and manholes will be maintained and the deposited silt and grit should be removed regularly to ensure they are functioning properly at all times.	To minimise potential water quality impacts arising from the construction works	All construction works area	SENTX Contractor		✓			*ProPECC PN 1/94* *WPCO* *EIAO-TM Annex 6*	Deficiency of mitigation measures but rectified by the Contractor
6.8.1	WQ4	• Temporary covers such as tarpaulin will also be provided to minimise the	To minimise potential water quality impacts arising from the	All construction works area	SENTX Contractor		✓			*ProPECC PN 1/94* *WPCO*	Implemented

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						D	C	O/R	A		
		generation of high SS runoff.	construction works								
6.8.1	WQ5	• The surface runoff contained any oil and grease will pass through the oil interceptors.	To minimise potential water quality impacts arising from the construction works	All construction works area	SENTX Contractor		✓			*ProPECC PN 1/94 WPCO EIAO-TM Annex 6*	Implemented
6.8.1	WQ6	• All sewer and drains will be sealed to prevent building debris, soil etc from entering public sewers/drains before commencing any demolition works	To minimise potential water quality impacts arising from the demolition works	Infrastructure area at existing SENT Landfill	SENTX Contractor		✓			*ProPECC PN 1/94 WPCO EIAO-TM Annex 6*	Not applicable
6.8.1	WQ7	• During the excavation works for the twin drainage tunnels, the recycle water for cooling the cutter head of the TBM will be conveyed to the sedimentation tanks for treatment and most of the treated water will be reused, where applicable and as much as possible, in the boring operations.	To minimise potential water quality impacts arising from the tunnel works	Tunnel boring sites	SENTX Contractor		✓			*ProPECC PN 1/94 WPCO EIAO-TM Annex 6*	Not applicable. Excavation of drainage tunnels is not required in the latest landfill design.
6.8.1	WQ8	• The fuel and waste lubricant oil from the on-	To minimise potential water	SENTX Site	SENTX Contractor		✓			*ProPECC PN 1/94*	Implemented

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						D	C	O/R	A		
		site maintenance of machinery and equipment will be collected by a licensed chemical waste collector.	quality impacts arising from improper handling of fuel and oil							*WPCO* *Waste Disposal Ordinance (WDO)*	
6.8.1	WQ9	• Implementation of excavation schedules, lining and covering of excavated stockpiles	To minimise contaminated stormwater run-off from the SENTX Site	All construction works	SENTX Contractor		✓			*ProPECC PN 1/94* *WPCO* *EIAO-TM Annex 6*	Implemented
6.13	WQ10	• Monitoring of surface water quality will be conducted on a regular basis as stated in the EM&A Manual.	To minimise potential water quality impacts on surface water arising from the construction works	SENTX Site	SENTX Contractor		✓			*WPCO* *Water-TM*	Implemented
6.8.2	WQ11	<u>Sewage Effluents</u> • Sufficient chemical toilets will be provided for the construction workforce.	To minimise potential water quality impacts arising from the sewage effluents	SENTX Site	SENTX Contractor		✓			*WPCO*	Implemented
6.8.2	WQ12	• Untreated sewage will not be allowed to discharge into the surrounding water body.	To minimise potential water quality impacts arising from the sewage effluents	SENTX Site	SENTX Contractor		✓			*WPCO* *WDO*	Implemented
6.8.2	WQ13	• A licensed waste collector	To minimise potential water	SENTX Site	SENTX Contractor		✓			*WPCO*	Implemented

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						D	C	O/R	A		
		will be employed to clean the chemical toilets on a regular basis.	quality impacts arising from the sewage effluents							*WDO*	
Water Quality – Operation/Restoration and Aftercare Phases											
6.9.1	WQ14	<u>Surface Water Management</u> • Inspections of the drainage system, sand traps, settlement ponds and surface water channels will be performed regularly to identify areas necessary for maintenance, cleaning or repair.	To minimise potential water quality impacts on surface water arising from the landfill operations.	SENTX Site	SENTX Contractor			✓		*WPCO Technical Memorandum Standards for Effluents Discharged into Drainage and Sewerage Systems, Inland and Inshore Waters (Water-TM)* *EIAO-TM Annex 6*	Deficiency of mitigation measures but rectified by the Contractor
6.9.1	WQ15	• Regular maintenance and replacement, if required, of the HDPE liner will be conducted to prevent degradation from affecting the performance of the capping system.	To minimise potential water quality impacts on surface water arising from the landfill operations.	SENTX Site	SENTX Contractor			✓		*WPCO Water-TM* *EIAO-TM Annex 6*	Implemented
6.9.1	WQ16	• Monitoring of surface water quality will be conducted on a regular	To minimise potential water quality impacts on surface water	SENTX Site	SENTX Contractor			✓	✓	*WPCO Water-TM*	Implemented

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						D	C	O/R	A		
		basis as stated in the EM&A Manual.	arising from the landfill operations.								
6.9.2 and SENTX latest design	WQ17	<u>Groundwater Management</u> • The groundwater management facilities including the groundwater monitoring wells will be inspected regularly during routine groundwater monitoring programme.	To minimise potential water quality impacts on groundwater arising from the landfill operations.	SENTX Site	SENTX Contractor			✓	✓	*WPCO Water-TM EIAO-TM Annex 6*	Implemented
6.9.2	WQ18	• Monitoring of groundwater water quality will be conducted on a regular basis as stated in the EM&A Manual.	To minimise potential water quality impacts on groundwater arising from the landfill operations.	SENTX Site	SENTX Contractor			✓	✓	*WPCO Water-TM EIAO-TM Annex 6*	Implemented
SENTX latest design	WQ19	<u>Sewage</u> • All sewage from the operation staff will be diverted to the LTP for treatment or public sewer, if available.	To ensure proper handling of sewage	SENTX Site	SENTX Contractor			✓	✓	-	Implemented
6.9.3	WQ20	<u>Leachate Management</u> • The leachate pump houses and related ancillary	To minimise potential water quality impacts on surrounding	Leachate pump houses and related	SENTX Contractor			✓	✓	*WPCO Water-TM EIAO-TM Annex 6*	Implemented

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						D	C	O/R	A		
		equipment will be inspected regularly and repairs, if necessary.	water bodies arising from the landfill operations.	ancillary equipment							
6.9.3	WQ21	• For equipment such as pumps that require routine scheduled maintenance, the maintenance will be performed following manufacturer's recommended frequency.	To minimise potential water quality impacts on surrounding water bodies arising from the landfill operations.	Leachate pumps	SENTX Contractor			✓	✓	*WPCO Water-TM*	Implemented
6.9.3	WQ22	• Preventive maintenance will be implemented so that the possibility for forced shutdown during wet season will be kept to minimal.	To minimise potential water quality impacts on surrounding water bodies arising from the landfill operations.	Leachate treatment plant	SENTX Contractor			✓	✓	*WPCO Water-TM EIAO-TM Annex 6*	Implemented
6.9.3	WQ23	• Emergency procedures or a contingency plan will be established when the LTP is malfunctioned.	To minimise potential water quality impacts on surrounding water bodies arising from the landfill operations.	Leachate treatment plant	SENTX Contractor			✓	✓	*WPCO Water-TM EIAO-TM Annex 6*	Implemented

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						D	C	O/R	A		
6.9.3 and SENTX latest design	WQ24	• There will be sufficient redundancy in the system to handle the leachate flow even if one treatment train is down for maintenance. The leachate may be required to temporarily store within the landfill if the leachate storage lagoon are full and leachate cannot be transported to the LTP for treatment.	To minimise potential water quality impacts on surrounding water bodies arising from the landfill operations.	Leachate treatment plant	SENTX Contractor			✓	✓	*WPCO Water-TM EIAO-TM Annex 6*	Implemented
6.13	WQ25	• Monitor the quality of effluent discharged from the LTP	To ensure discharge quality comply with WPCO requirement	Leachate treatment plant discharge point	SENTX Contractor			✓	✓	*WPCO Water-TM*	Implemented
6.10.1	WQ26	<u>Potential Leakage of Leachate</u> • Regular groundwater quality monitoring will be carried out to monitor the performance of the leachate containment system.	To minimise potential water quality impacts on surrounding water bodies arising from the landfill operations.	SENTX Site	SENTX Contractor			✓	✓	*WPCO Water-TM*	Implemented
6.10.1	WQ27	• Maintenance and replacement of the capping system should be	To minimise potential water quality impacts on surrounding	SENTX Site	SENTX Contractor			✓	✓	*WPCO Water-TM*	Implemented

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		carried out, if necessary, to prevent control infiltration and leachate seepage from any damaged cap.	water bodies arising from the leachate leakage.							*EIAO-TM Annex 6*	
6.10.1	WQ28	• Maintaining control of the leachate level through extraction	To minimise potential water quality impacts on surrounding water bodies arising from surface breakout of leachate.	SENTX Site	SENTX Contractor			✓	✓	*WPCO Water-TM EIAO-TM Annex 6*	Implemented
Waste Management – Construction Phase											
7.6.1	WM1	All the necessary waste disposal permits are obtained prior to the commencement of construction work.	To ensure compliance with relevant statutory requirements	Before construction works commence	SENTX Contractor	✓	✓			*WDO*	Implemented
7.6.1	WM2	<u>Management of Waste Disposal</u> The construction contractor will open a billing account with the EPD. Every construction waste or public fill load to be transferred to the Government waste	To ensure that adverse environmental impacts are prevented	SENTX Site	SENTX Contractor		✓			*WDO Waste Disposal (Charges for Disposal of Construction Waste) Regulation; Works Bureau Technical Circular*	Implemented

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		disposal facilities such as public fill reception facilities, sorting facilities, landfills will required a valid "chit" which contains the information of the account holder to facilitate waste transaction recording and billing to the waste producer. A trip-ticket system will also be established to monitor the disposal of construction waste at the SENT Landfill and to control fly-tipping. The trip-ticket system will be included as one of the contractual requirements and implemented by the contractor. A recording system for the amount of waste generated, recycled and disposed of (including the disposal sites) will be established.								*No.31/2004; and Annex 5 and Annex 6 of Appendix G of ETWBTC No. 19/2005)*	

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7.6.1	WM3	<u>Measures for the reduction of construction waste generation</u> Inert and non-inert construction waste will be segregated and stored in different containers or skips to facilitate reuse or recycling of the inert waste and proper disposal of the non-inert construction waste. Specific areas of the work site will be designated for such segregation and storage if immediate use is not practicable.	To reduce construction waste generation	SENTX Site	SENTX Contractor		✓			*WDO EIAO-TM Annex 7*	Implemented
7.6.1	WM4	<u>Chemical Waste</u> The construction contractor will register as a chemical waste producer with the EPD. Chemical waste will be handled in accordance with the *Code of Practice on the Packaging, Handling and Storage of Chemical Wastes.*	To ensure proper handling of chemical waste	SENTX Site	SENTX Contractor		✓			*WDO Code of Practice on the Packaging, Handling and Storage of Chemical Wastes*	Implemented

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7.6.1	WM5	<u>Sewage</u> An adequate number of portable toilets will be provided at the site to ensure that sewage from site staff is properly collected. The portable toilets will be desludged and maintained regularly by a specialist contractor.	To ensure proper handling of sewage	SENTX Site	SENTX Contractor		✓			*WDO EIAO-TM Annex 7*	Implemented
7.6.1 and SENTX latest design	WM6	<u>General Refuse</u> General refuse will be stored in enclosed bins separately from construction and chemical wastes. The general refuse will be delivered to a transfer station or other landfill, separately from construction and chemical wastes, on a daily basis to reduce odour, pest and litter impacts. Recycling bins will be provided at strategic	To ensure proper handling of general refuse	SENTX Site	SENTX Contractor		✓			*WDO EIAO-TM Annex 7*	Implemented

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						D	C	O/R	A		
		locations to facilitate recovery of aluminium can and waste paper from the SENTX Site. Materials recovered will be sold for recycling.									
7.6.1	WM7	<u>Staff Training</u> At the commencement of the construction works, training will be provided to workers on the concepts of site cleanliness and on appropriate waste management procedures, including waste reduction, reuse and recycling.	To ensure that adverse environmental impacts are prevented	SENTX Site	SENTX Contractor		✓				Implemented
7.8	WM8	<u>Environmental Monitoring & Audit Requirements</u> Weekly audits of the waste management practices will be carried out during the construction phase. The audits examine all aspects of waste management including	To ensure that adverse environmental impacts are prevented	SENTX Site	SENTX Contractor		✓			*WDO*	Implemented

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						D	C	O/R	A		
		waste generation, storage, recycling, transport and disposal.									
Waste Management – Operation/Restoration Phase											
7.6.2 and SENTX latest design	WM9	Sludge In case off-site disposal is required, the Contractor will ensure that sludge generated from the LTP will be delivered in closed container to other waste disposal facility e.g. other landfills or a sludge treatment facility, for proper disposal on a daily basis.	To ensure proper handling of sludge	SENTX Site	SENTX Contractor			✓		*WDO EIAO-TM Annex 7*	Not applicable
7.6.2	WM10	Chemical Waste The construction contractor will register as a chemical waste producer with the EPD. Chemical waste will be handled in accordance with the *Code of Practice on the Packaging, Handling and Storage of Chemical Wastes.*	To ensure proper handling of chemical waste	SENTX Site	SENTX Contractor			✓		*WDO EIAO-TM Annex 7* *Code of Practice on the Packaging, Handling and Storage of Chemical Wastes*	Implemented

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7.6.2	WM11	<u>Sewage</u> All sewage from the operation staff will be diverted to the LTP for treatment or public sewer, if available.	To ensure proper handling of sewage	SENTX Site	SENTX Contractor			✓		*WDO EIAO-TM Annex 7*	Moved to mitigation measure under water quality WQ19. It is a measure for water quality rather than waste management.
7.6.2 and SENTX latest design	WM12	<u>General Refuse</u> General refuse will be stored in enclosed bins and disposed of at other landfills or transfer station on a daily basis to reduce odour, pest and litter impacts. Recycling bins will be provided at strategic locations to facilitate recovery of aluminium can and waste paper from the SENTX Site. Materials recovered will be sold for recycling.	To ensure proper handling of general refuse	SENTX Site	SENTX Contractor			✓		*WDO EIAO-TM Annex 7*	Implemented

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Landfill Gas Hazards – Design and Construction Phase											
8.6.2 and SENTX latest design	LFG1	Precautionary measures to be adopted by the contractors at the Project site and the adjacent development site within the landfill consultation zone are outlined in Paragraphs 8.3 to 8.49 of EPD's *Landfill Gas Hazard Assessment Guidance Notes (the Guidance Note*). Those precautionary measures applicable to the SENTX will be confirmed in the detailed Qualitative Landfill Gas Hazard Assessment to be submitted by the contractor.	To protect workers from landfill gas risk	All construction works area	SENTX Contractor		✓			*Paragraphs 8.3 to 8.49 of EPD's Landfill Gas Hazards Assessment Guidance Note EIAO-TM Annex 7*	Implemented
8.6.2	LFG2	Monitoring will be undertaken when construction works are carried out in confined space within the consultation zone with reference to the monitoring requirements and procedures specified in	To protect workers from landfill gas risk	Confined space within the construction works area	SENTX Contractor		✓				Implemented

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		Paragraphs 8.23 to 8.28 of EPD's *Guidance Note* will be followed. In the event of the trigger levels being exceeded, it is recommended that a person, such as the Safety Officer, is nominated, with deputies, to be responsible for dealing with any emergency which may occur due to landfill gas. In an emergency situation, the nominated person, or his deputies, shall have the necessary authority and shall ensure that the confined space is evacuated and the necessary works implemented for reducing the concentrations of gas. The appropriate organisations shall be contact.									
8.6.3	LFG4	Implementation of engineering measures	To protect workers from landfill gas risk	SENTX Site	SENTX Contractor	✓	✓	✓	✓	*EIAO-TM Annex 7*	Implemented

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						D	C	O/R	A		
		according to Contract Specification requirements. These measures will include the placement of liner and installation of landfill gas management system to contain, manage and control landfill gas.									
8.6.3	LFG5	Engineering measures to significant engineering measures will be required in the design of the SENTX to protect the staff working in the infrastructure area. These measures include a combination of passive and active systems (examples are recommended in EPD's *Guidance Notes*). Landfill gas monitoring boreholes will be installed at the edge of the waste slope between the waste and the new infrastructure area to	To protect workers from landfill gas risk	Infrastructure Area	SENTX Contractor	✓	✓			*EPD's Landfill Gas Hazards Assessment Guidance Note EIAO-TM Annex 7*	Implemented

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						D	C	O/R	A		
		monitor the migration of landfill gas, if any.									
Landfill Gas Hazards – Operation, Restoration and Aftercare Phases											
8.6.4	LFG7	To train and ensure staff to take appropriate precautions at all times when entering enclosed spaces or plant rooms. Undertake regular monitoring of landfill gas at the perimeter boreholes to detect if there are any signs of off-site landfill gas migration. Prepare and implement emergency plan in case off-site landfill gas migration is detected. A permanent gas monitoring system with alarm will be installed and operated in all occupied on-site buildings.	To protect workers from landfill gas risk	SENTX Site	SENTX Contractor			✓	✓	*Landfill Gas Hazards Assessment Guidance Note*	Implemented
8.7 and SENTX latest design	LFG8	<u>Environmental Monitoring & Audit Requirements</u> Undertake regular monitoring of landfill gas within the	To protect workers from landfill gas risk	Within the SENTX and along the SENTX boundary	SENTX Contractor			✓	✓	*Landfill Gas Hazards Assessment Guidance Note*	Implemented

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						D	C	O/R	A		
		SENTX and along the SENTX boundary as required by the Contract Specification.									
Ecology – Construction Phase											
9.10.2	EC1	Measures to control construction runoff: • Exposed soil areas will be minimised to reduce the contamination of runoff and erosion;	To minimise potential water quality impacts affecting ecological resources	All construction works area	SENTX Contractor		✓			*EIAO-TM Annex 16* *ProPECC PN 1/94 Water Pollution Control Ordinance (WPCO)* *EIAO-TM Annex 6*	Implemented
		• To prevent stormwater runoff from washing across exposed soil surfaces, perimeter channels will be constructed in advance of site formation works and earthworks and intercepting channels will be provided for example along the edge of excavation;								-	Implemented

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						D	C	O/R	A		
		• Silt removal facilities, channels and manholes will be maintained and the deposited silt and grit will be removed regularly to ensure they are functioning properly at all times;								-	Deficiency of mitigation measures but rectified by the Contractor
		• Temporary covers such as tarpaulin will also be provided to minimise the generation of high suspended solids runoff;								-	Implemented
		• The surface runoff contained any oil and grease will pass through the oil interceptors; and,								-	Implemented
		• Control measures, including implementation of excavation schedules, lining and covering of excavated stockpiles will be implemented to minimise contaminated stormwater run-off from the SENTX site.								-	Implemented

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						D	C	O/R	A		
9.10.2 and SENTX latest design	EC2	<u>Good Construction Practice</u>: • Fences along the boundary of the SENTX Site will be erected before the commencement of works to prevent vehicle movements, and encroachment of personnel, onto adjacent areas. • The work site boundaries will be regularly checked to ensure that they are not breached and that damage does not occur to surrounding areas.	To minimise potential ecological impacts arising from the Project	SENTX Site	SENTX Contractor		✓			*EIAO-TM Annex 16*	Implemented
Ecology – Operation, Restoration and Aftercare Phases											
9.10.2	EC3	<u>Measures for Controlling Leakage of Landfill Leachate</u> Leachate will be contained within the SENTX Site by the proposed impermeable leachate containment system and collected by the installation of drainage system to prevent potential	To minimise potential water quality impact affecting the ecological resources	SENTX Site	SENTX Contractor			✓	✓	*EIAO-TM Annex 16* *WPCO Water-TM* *EIAO-TM Annex 6*	Implemented

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						D	C	O/R	A		
		migration of leachate to habitats in the vicinity.									
9.10.2	EC4	<u>Measures for Controlling Migration of Landfill Gas</u> Disturbance to habitat in the vicinity and associated wildlife due to migration of landfill gas will be prevented by proper management of the landfill gas generated from the SENTX. Ignition fires will be prohibited to occur within the boundary of the SENTX Site. Surface emission and off-site migration of landfill gas will be regularly monitored.	To minimise potential landfill gas migration affecting ecological resources	SENTX Site	SENTX Contractor			✓	✓	*EIAO-TM Annex 16*	Implemented
9.10.3 and SENTX latest design	EC5	The following compensation planting is recommended as the mitigation measures for the habitat affected due to the SENTX: • Provision of 6 ha of mixed woodland planting	Compensation of habitat loss due to the Project	SENTX Site	SENTX Contractor			✓	✓	*EIAO-TM Annex 16*	Not applicable

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						D	C	O/R	A		
		to compensate the loss of shrubland; and • Provision of a mosaic of grassland and shrubland in the remaining areas of the SENTX Site. • Compensatory planting and restoration of the SENTX can be implemented progressively according to the filling plan of SENTX.									
9.10.3	EC6	The mixture of grassland, shrubland and woodland habitats are recommended to diversify the habitats for supporting various wildlife in particular butterflies, birds and herpetofauna and blend into the existing undisturbed ecological environment.	To diversify habitats	SENTX Site	SENTX Contractor			✓	✓	*EIAO-TM Annex 16*	Not applicable
9.10.3	EC7	Indigenous plant species of shallow root system, softwood in nature and adaptive to sea shore habitat are recommended to be used	To enhance ecological value of the habitats	SENTX Site	SENTX Contractor			✓	✓	*EIAO-TM Annex 16*	Not applicable

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		in the restoration plan, which can establish well in coastal area with exposure to strong wind and salt spray, with sand soil base. Taking consideration of the relative poor substrate and the difficulties of establishment of some native trees in Hong Kong, it is recommended to include approximately 20% of non-native tree species in the compensatory woodland. The non-native tree species can serve as a nurse species to facilitate the establishment of the native tree species, especially the shading, and it can be replaced by established native tree species progressively. Plant species can also make reference to food plants of butterfly species (in particularly butterfly species of conservation interests									

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						D	C	O/R	A		
		recorded within the CWBCP).									
9.10.3	EC8	It is also recommended that a trial nursery for native plant species be set up to fine tone the planting matrix and management intensity of the recommended indigenous tree species for the restoration of the SENTX. It should be noted that native shrubs and tree species had been used for restoration of the existing SENT Landfill, native plant species that could not successfully be established on the existing SENT Landfill should be reviewed before the preparation of the compensatory planting list. Special care and intensive management of native plant should be implemented in order to ensure proper establishment of the native	To select the most suitable indigenous tree species for the SENTX	SENTX Site	SENTX Contractor	✓		✓	✓	*EIAO-TM Annex 16*	Implemented

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						D	C	O/R	A		
		plants.									
9.12.1	EC9	<u>Environmental Monitoring & Audit Requirements</u> The implementation of the ecological mitigation measures should be checked as part of the environmental monitoring and audit procedures during the construction period.	To ensure that adverse ecological impacts are prevented	SENTX	SENTX Contractor		✓	✓	✓	*EIAO-TM Annex 16*	Implemented
Landscape and Visual – Construction Phase											
10.6.5	LV1	CM1 - The construction area and area allowed for the contractor's office, leachate treatment plant and laboratory areas will be minimised to a practical minimum, to avoid impacts on adjacent landscape.	To minimise the landscape and visual impacts	SENTX Site	SENTX Contractor		✓			*EIAO-TM Annex 18 and ETWBC 3/2006*	Implemented
10.6.5	LV2	CM2 - Topsoil, where identified, will be stripped and stored for re-use in the construction of the soft	To minimise the landscape and visual impacts	All construction works area	SENTX Contractor		✓			*EIAO-TM Annex 18*	Not applicable

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		landscape works, where practical. The Contract Specification will include storage and reuse of topsoil as appropriate.									
10.6.5	LV3	CM3 - All existing trees at the edges of the landfill will be carefully protected during construction. Detailed Tree Protection Specification will be provided in the Contract Specification. Under this Specification, the Contractor will be required to submit, for approval, a detailed working method statement for the protection of trees prior to undertaking any works adjacent to all retained trees, including trees in Contractor's works areas.	To minimise the landscape and visual impacts	Potential impacted area	SENTX Contractor		✓			*EIAO-TM Annex 18 and ETWBC 3/2006*	Implemented
10.6.5	LV4	CM4 - Trees unavoidably affected by the works will be transplanted, where	To minimise the landscape and visual impacts	Potential impacted area	SENTX Contractor	✓	✓			*EIAO-TM Annex 18 and ETWBC 3/2006*	Implemented

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						D	C	O/R	A		
		necessary and practical. A detailed Tree Transplanting Specification will be provided in the Contract Specification, if applicable. Sufficient time for necessary tree root and crown preparation periods will be allowed in the project programme.									
10.6.5 and SENTX latest design	LV5	CM5 - Within 3 months of taking possession of the SENTX Site, the Contractor will plant advance screen planting of native species at Light Standard size at 1.5m centres along the High Junk Peak Trail so as to screen views of the Works from the trail. Tree planting locations will be agreed with AFCD. Works will be completed within 9 months of taking possession of the SENTX Site.	To minimise the landscape and visual impacts	At High Junk Peak Hiking Trail	SENTX Contractor		✓			*EIAO-TM Annex 18*	Implemented

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10.6.5	LV6	CM6 - The Contractor's office, leachate treatment plant and laboratory will be given an aesthetic treatment in earth tones to reduce their visual impact and albedo and blend them into the surrounding landscape.	To minimise the landscape and visual impacts	Infrastructure area	SENTX Contractor	✓	✓			*EIAO-TM Annex 18*	Implemented
10.6.5	LV7	CM7 - The Contractor's office, leachate treatment plant and laboratory will be surrounded by a minimum of 5m wide and 0.75m high earth bund on the west and south sides planted with a dense screen of tree and shrub vegetation. Additional tree planting will be provided in unused spaces with thin infrastructure site, along access roads and in and around car parks. This will be supplemented with shrub planting, where appropriate.	To minimise the landscape and visual impacts	Infrastructure area	SENTX Contractor	✓	✓			*EIAO-TM Annex 18 and ETWBC 7/2002*	Not applicable

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10.6.5	LV8	CM8 - Planting trials will be carried out in an on-site nursery prior to implementation of the first phase of restoration to establish the best planting matrix and management intensity of the recommended plant materials for the restoration.	To minimise the landscape and visual impacts	SENTX Site	SENTX Contractor		✓			*EIAO-TM Annex 18*	Implemented
11.4.1 and SENTX latest design	LV9	During the preparation of the detailed landscape design plan, the design submission will be audited against the recommendation proposed in the *ER Report* by the Registered Landscape Architect from the ET.	To ensure the implementation of mitigation measures proposed in this EIA Report	SENTX Site	SENTX Contractor/ET	✓	✓			*EIAO-TM Annex 18*	Implemented
Landscape and Visual – Operation/Restoration Phase											
10.6.5 and SENTX latest design	LV10	OM1 - Landfill materials will be covered with general fill material or tarpaulin sheet on a daily basis to reduce visual impact.	To minimise the landscape and visual impacts	Tipping area	SENTX Contractor			✓		*EIAO-TM Annex 18*	Implemented

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						D	C	O/R	A		
10.6.5 and SENTX latest design	LV11	OM2 - Filling and restoration will be phased during the course of operations in a minimum of 4 phases, the restoration of each phase to commence immediately on the completion of filling in that phase.	To minimise the landscape and visual impacts	Tipping area	SENTX Contractor			✓		*EIAO-TM Annex 18*	Implemented
10.6.5	LV12	OM3 - Catch fences will be erected at the perimeter of the waste boundary, to ensure that all waste stays within the site and is not blown into surrounding areas.	To minimise the landscape and visual impacts	Tipping area	SENTX Contractor			✓		*EIAO-TM Annex 18*	Implemented
10.6.5	LV13	OM4 - All night-time lighting will be reduced to a practical minimum both in terms of number of units and lux level and will be hooded and directional.	To minimise the landscape and visual impacts	Tipping area	SENTX Contractor			✓		*EIAO-TM Annex 18*	Implemented
11.4.2 and SENTX latest design	LV14	• The condition of the restoration plantation will be audited at monthly intervals by a Registered	To check the restoration plantation	SENTX Site	SENTX Contractor/ET			✓		*EIAO-TM Annex 18*	Not applicable

EIA Ref.	EM&A Ref	Environmental Protection Measures/ Mitigation Measures	Objectives of the Recommended Measure & Main Concerns to address	Location of the Measures	Who to implement the measure?	When to implement the measure? (1)				What requirements or standards for the measure to achieve?	Implementation Status and Remarks
						D	C	O/R	A		
		Landscape Architect from the ET.									

ANNEX C MONITORING SCHEDULE FOR THIS REPORTING PERIOD

South East New Territories (SENT) Landfill Extension
EM&A Impact Monitoring Schedule during Operation/ Restoration Phase

April 2024

Sun	Mon	Tue	Wed	Thu	Fri	Sat
	1 Dust Monitoring	2 Noise Monitoring	3	4	5	6
7 Dust Monitoring	8 Noise Monitoring	9	10 Groundwater Monitoring	11 Leachate Monitoring	12 Surface Water Monitoring Perimeter LFG Monitoring Service voids LFG Monitoring	13 Dust Monitoring
14	15 Noise Monitoring	16	17	18 Stack Monitoring	19 Dust Monitoring Stack Monitoring	20
21	22 Noise Monitoring	23	24 Odour Monitoring	25 Dust Monitoring	26	27
28	29	30				

South East New Territories (SENT) Landfill Extension
EM&A Impact Monitoring Schedule during Operation/ Restoration Phase

May 2024

Sun	Mon	Tue	Wed	Thu	Fri	Sat
			1 Dust Monitoring	2 Noise Monitoring	3 Groundwater Monitoring	4
5	6 Surface Water Monitoring Service voids LFG Monitoring	7 Dust Monitoring	8 Perimeter LFG Monitoring Perimeter LFG Bulk Gas Sampling Noise Monitoring	9 Stack Monitoring Leachate Monitoring	10 Stack Monitoring VOCs Monitoring	11
12	13 Dust Monitoring	14 Noise Monitoring Flammable Gas Monitoring	15	16 Groundwater Monitoring Additional Surface Water Monitoring	17	18
19 Dust Monitoring	20 Noise Monitoring	21 Odour Monitoring	22	23	24	25 Dust Monitoring
26	27 Noise Monitoring	28	29	30 Additional Surface Water Monitoring	31 Dust Monitoring	

South East New Territories (SENT) Landfill Extension
EM&A Impact Monitoring Schedule during Operation/ Restoration Phase

June 2024

Sun	Mon	Tue	Wed	Thu	Fri	Sat
						1
2	3 Perimeter LFG Monitoring Service voids LFG Monitoring Noise Monitoring	4	5 Additional Surface Water Monitoring	6 Dust Monitoring	7	8
9	10	11	12 Dust Monitoring Surface Water Monitoring Groundwater Monitoring	13 Leachate Monitoring	14 Noise Monitoring	15
16	17 Stack Monitoring	18 Dust Monitoring Odour Monitoring	19 Noise Monitoring	20	21	22
23	24 Dust Monitoring Additional Surface Water Monitoring	25 Noise Monitoring	26 Stack Monitoring	27	28	29
30 Dust Monitoring						

ANNEX D AIR QUALITY

ANNEX D1 24-HOUR TSP MONITORING RESULTS

TABLE D1.1 24-HOUR TSP MONITORING RESULTS AT AM1

Start Date	Start Time	Finish Date	Finish Time	Weather	24-hour TSP ($\mu g/m^3$)
1 Apr 24	8:00	2 Apr 24	8:00	Fine	79
7 Apr 24	8:00	8 Apr 24	8:00	Cloudy	79
13 Apr 24	8:00	14 Apr 24	8:00	Fine	100
19 Apr 24	8:00	20 Apr 24	8:00	Cloudy	67
25 Apr 24	8:00	26 Apr 24	8:00	Cloudy	43
1 May 24	8:00	2 May 24	8:00	Cloudy	32
7 May 24	8:00	8 May 24	8:00	Fine	135
13 May 24	8:00	14 May 24	8:00	Sunny	150
19 May 24	8:00	20 May 24	8:00	Cloudy	241
25 May 24	8:00	26 May 24	8:00	Cloudy	32
31 May 24	8:00	1 Jun 24	8:00	Cloudy	57
6 Jun 24	8:00	7 Jun 24	8:00	Cloudy	36
12 Jun 24	8:00	13 Jun 24	8:00	Fine	46
18 Jun 24	8:00	19 Jun 24	8:00	Cloudy	37
24 Jun 24	8:00	25 Jun 24	8:00	Fine	41
30 Jun 24	8:00	1 Jul 24	8:00	Fine	37
				Average	76
				Min	32
				Max	241

FIGURE D1.1 GRAPHICAL PRESENTATION FOR 24-HR TSP MONITORING AT AM1

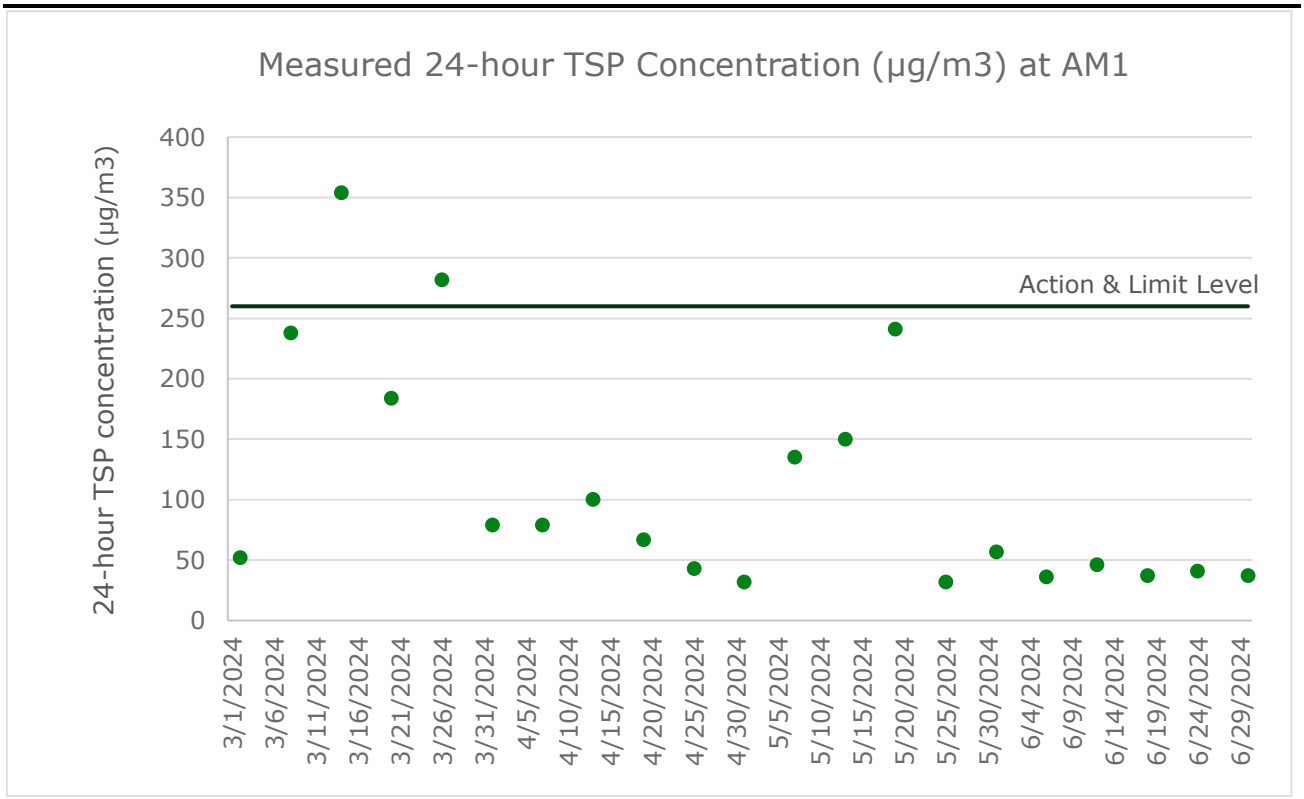


TABLE D1.2 24-HOUR TSP MONITORING RESULTS AT AM2

Start Date	Start Time	Finish Date	Finish Time	Weather	24-hour TSP ($\mu g/m^3$)
1 Apr 24	8:00	2 Apr 24	8:00	Fine	77
7 Apr 24	8:00	8 Apr 24	8:00	Cloudy	117
13 Apr 24	8:00	14 Apr 24	8:00	Fine	71
19 Apr 24	8:00	20 Apr 24	8:00	Cloudy	66
25 Apr 24	8:00	26 Apr 24	8:00	Cloudy	79
1 May 24	8:00	2 May 24	8:00	Cloudy	41
7 May 24	8:00	8 May 24	8:00	Fine	167
13 May 24	8:00	14 May 24	8:00	Sunny	117
19 May 24	8:00	20 May 24	8:00	Cloudy	154
25 May 24	8:00	26 May 24	8:00	Cloudy	61
31 May 24	8:00	1 Jun 24	8:00	Cloudy	49
6 Jun 24	8:00	7 Jun 24	8:00	Cloudy	51
12 Jun 24	8:00	13 Jun 24	8:00	Fine	139
18 Jun 24	8:00	19 Jun 24	8:00	Cloudy	52
24 Jun 24	8:00	25 Jun 24	8:00	Fine	70
30 Jun 24	8:00	1 Jul 24	8:00	Fine	68
				Average	87
				Min	41
				Max	167

FIGURE D1.2 GRAPHICAL PRESENTATION FOR 24-HR TSP MONITORING AT AM2

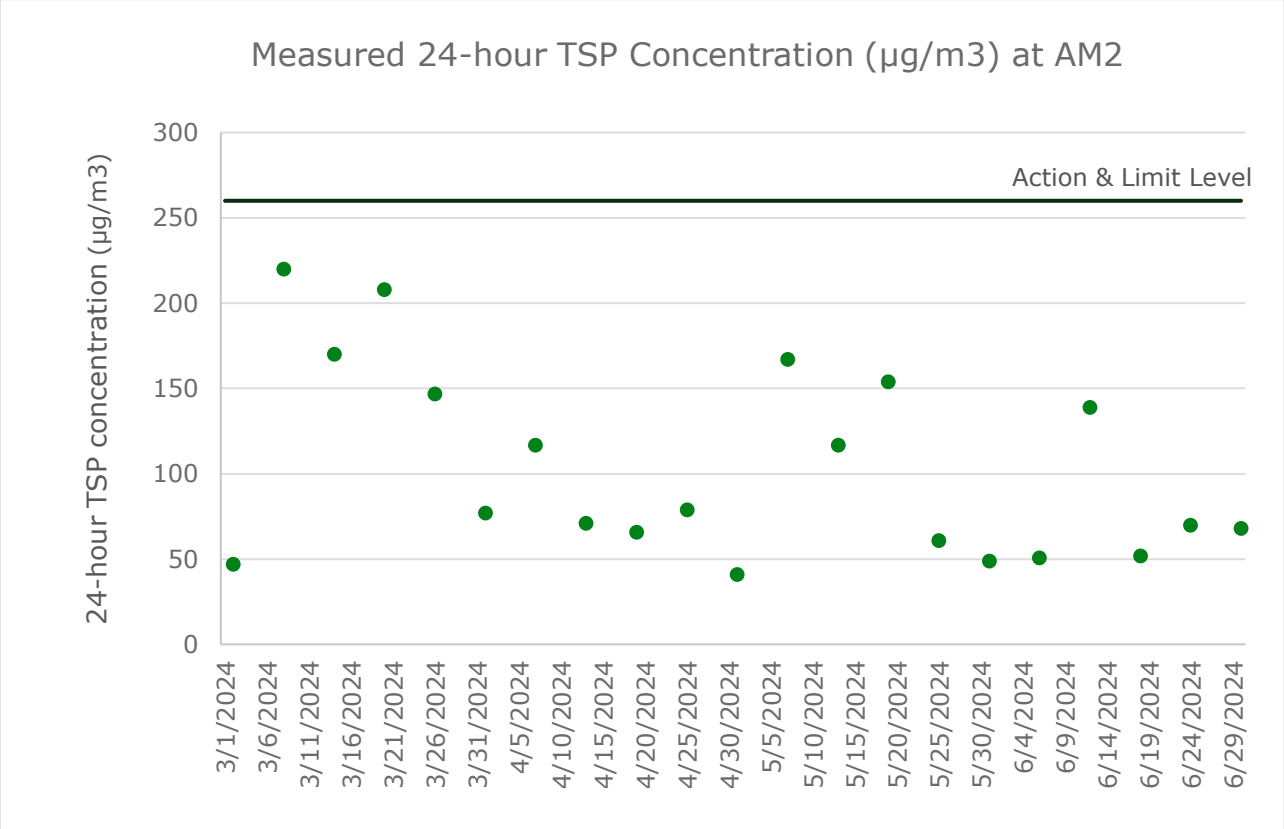


TABLE D1.3 24-HOUR TSP MONITORING RESULTS AT AM3

Start Date	Start Time	Finish Date	Finish Time	Weather	24-hour TSP (µg/m^3)
1 Apr 24	8:00	2 Apr 24	8:00	Fine	71
7 Apr 24	8:00	8 Apr 24	8:00	Cloudy	91
13 Apr 24	8:00	14 Apr 24	8:00	Fine	97
19 Apr 24	8:00	20 Apr 24	8:00	Cloudy	79
25 Apr 24	8:00	26 Apr 24	8:00	Cloudy	56
1 May 24	8:00	2 May 24	8:00	Cloudy	28
7 May 24	8:00	8 May 24	8:00	Fine	242
13 May 24	8:00	14 May 24	8:00	Sunny	216
19 May 24	8:00	20 May 24	8:00	Cloudy	122
25 May 24	8:00	26 May 24	8:00	Cloudy	56
31 May 24	8:00	1 Jun 24	8:00	Cloudy	96
6 Jun 24	8:00	7 Jun 24	8:00	Cloudy	61
12 Jun 24	8:00	13 Jun 24	8:00	Fine	96
18 Jun 24	8:00	19 Jun 24	8:00	Cloudy	56
24 Jun 24	8:00	25 Jun 24	8:00	Fine	85
				Average	97
				Min	28
				Max	242

FIGURE D1.3 GRAPHICAL PRESENTATION FOR 24-HR TSP MONITORING AT AM3

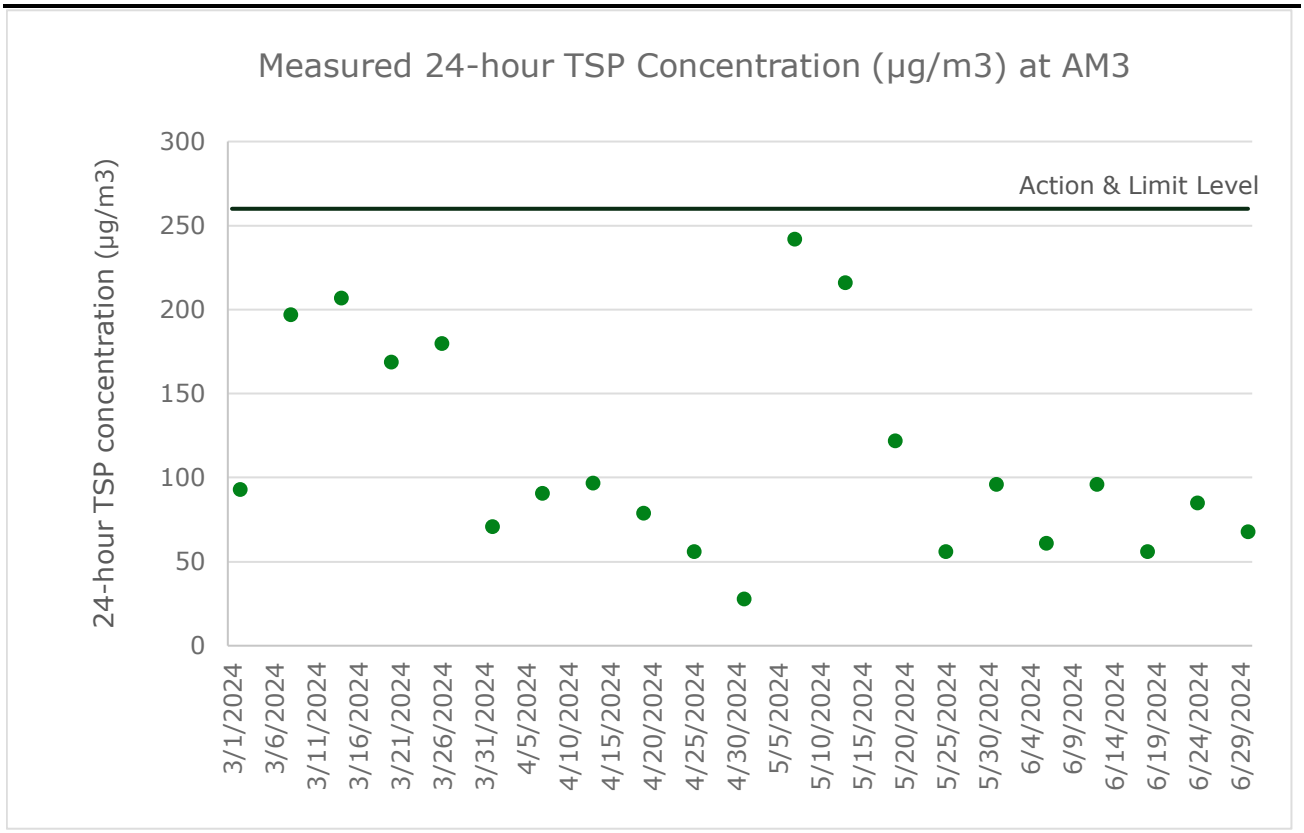
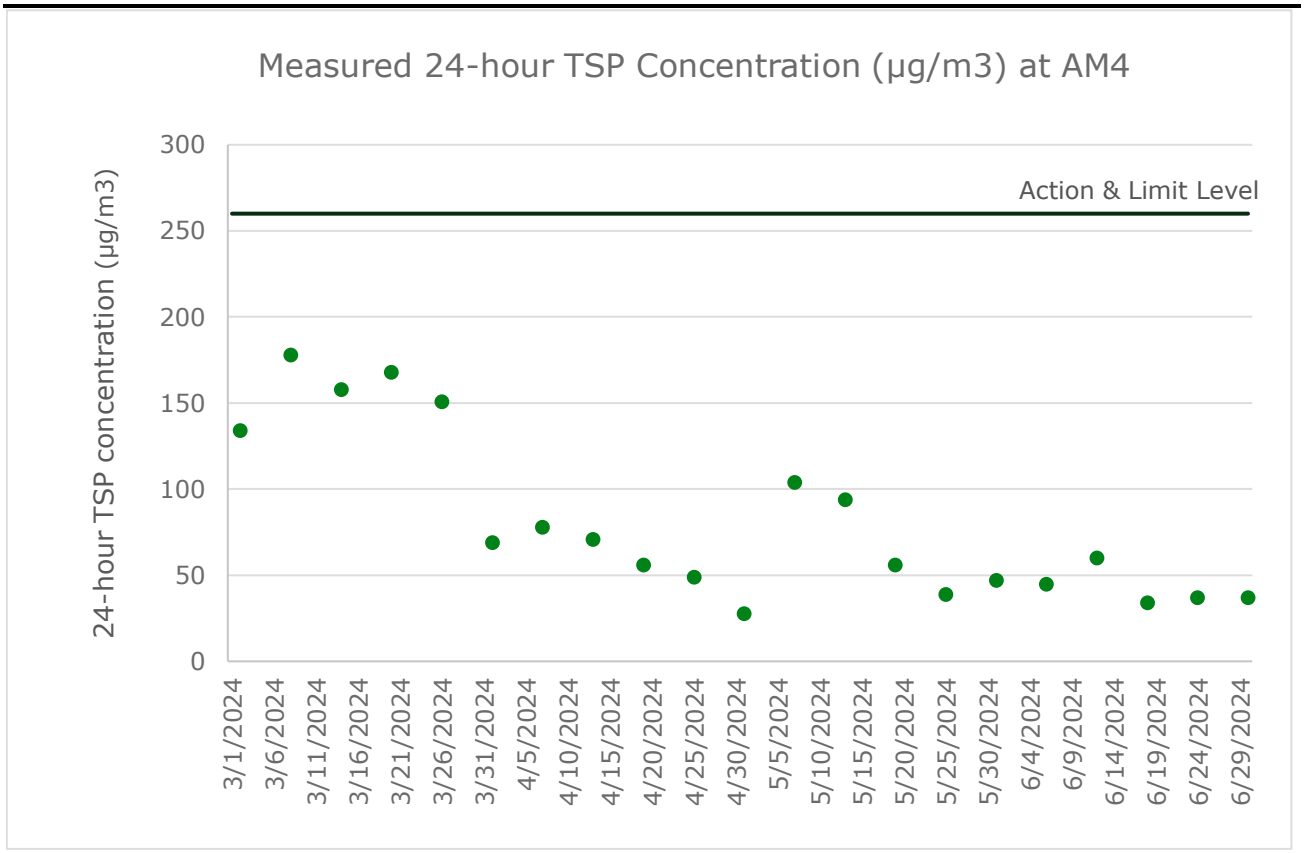


TABLE D1.4 24-HOUR TSP MONITORING RESULTS AT AM4

Start Date	Start Time	Finish Date	Finish Time	Weather	24-hour TSP ($\mu g/m^3$)
1 Apr 24	8:00	2 Apr 24	8:00	Fine	69
7 Apr 24	8:00	8 Apr 24	8:00	Cloudy	78
13 Apr 24	8:00	14 Apr 24	8:00	Fine	71
19 Apr 24	8:00	20 Apr 24	8:00	Cloudy	56
25 Apr 24	8:00	26 Apr 24	8:00	Cloudy	49
1 May 24	8:00	2 May 24	8:00	Cloudy	28
7 May 24	8:00	8 May 24	8:00	Fine	104
13 May 24	8:00	14 May 24	8:00	Sunny	94
19 May 24	8:00	20 May 24	8:00	Cloudy	56
25 May 24	8:00	26 May 24	8:00	Cloudy	39
31 May 24	8:00	1 Jun 24	8:00	Cloudy	47
6 Jun 24	8:00	7 Jun 24	8:00	Cloudy	45
12 Jun 24	8:00	13 Jun 24	8:00	Fine	60
18 Jun 24	8:00	19 Jun 24	8:00	Cloudy	34
24 Jun 24	8:00	25 Jun 24	8:00	Fine	37
				Average	58
				Min	28
				Max	104

FIGURE D1.4 GRAPHICAL PRESENTATION FOR 24-HR TSP MONITORING AT AM4



ANNEX D2 EVENT AND ACTION PLAN FOR AIR QUALITY MONITORING

ANNEX D2 EVENT AND ACTION PLAN FOR AIR QUALITY MONITORING DURING OPERATION/ RESTORATION PHASE

Action			
Event	**ET**	**IEC**	**Contractor**
Exceedance of Action/Limit Level for dust monitoring	• Identify the source(s) and investigate the cause(s) of exceedance • Prepare the Notification of Exceedance within 24 hours • Inform Contractor, IEC, Project Proponent and EPD (EIAO Authority) whether the cause of exceedance is due to the Project • Discuss with Contractor and IEC for remedial measures • Ensure remedial measures are properly implemented • Assess effectiveness of Contractor's remedial measures and keep the Project Proponent and IEC informed of the results • Repeat measurement to confirm finding if exceedance is due to the Project • Increase monitoring frequency to daily and continue until the monitoring results reduce to below action level	• Verify the Notification of Exceedance • Check monitoring data submitted by ET • Check Contractor's working methods • Discuss with ET and Contractor on proposed remedial measures • Review proposals on remedial measures • Audit the implementation of the remedial measures • Audit the effectiveness of the implemented remedial measures	• Take immediate action to avoid further exceedance • Submit proposals for remedial measures to IEC • Implement the agreed proposals • Amend proposal if appropriate
Exceedance of Action Level for odour	• Identify source(s) and investigate the cause(s) of exceedance or complaint • Prepare the odour complaint form or the Notification of Exceedance within 24 hours • Inform Contractor, IEC and Project Proponent whether the cause of exceedance is due to the Project • Discuss with Contractor and IEC for remedial measures • Ensure remedial measures are properly implemented • Increase monitoring frequency to daily	• Verify the Notification of Exceedance • Check monitoring data submitted by ET • Check Contractor's working methods • Discuss with ET and Contractor on proposed remedial measures • Review proposals on remedial measures • Audit the implementation of the remedial measures • Audit the effectiveness of the implemented remedial measures	• Rectify any unacceptable practice • Amend working methods as required • Implement amended working methods, if necessary

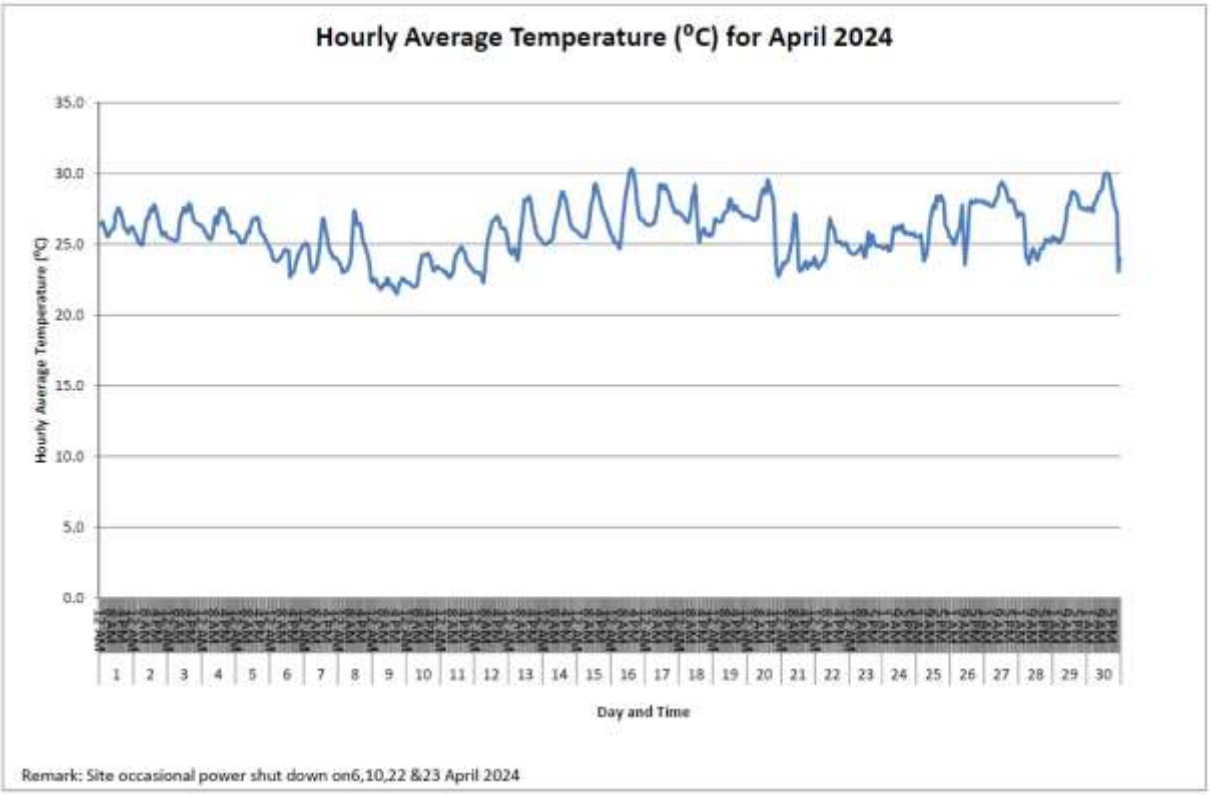
Action			
Event	**ET**	**IEC**	**Contractor**
	until odour not being detected for three consecutive days		
Exceedance of Limit Level for odour	• Identify source(s) and investigate the cause(s) of exceedance or complaint • Prepare the odour complaint form or the Notification of Exceedance within 24 hours • Inform Contractor, IEC, Project Proponent and EPD (EIAO Authority) whether the cause of exceedance is due to the Project • Discuss with Contractor and IEC for remedial measures • Ensure remedial measures are properly implemented • Assess effectiveness of Contractor's remedial measures and keep the Project Proponent and IEC informed of the results	• Verify the Notification of Exceedance • Check with Contractor on the operating activities and implementation of odour mitigation measures • Discuss with ET and Contractor on proposed remedial measures • Review proposals on remedial measures • Audit the implementation of the remedial measures • Audit the effectiveness of the implemented remedial measures	• Rectify any unacceptable practice • Submit proposals for remedial measures to IEC within 3 working days of notification • Implement the agreed proposal or amend working methods as required • Resubmit proposals if problem still not under control
Exceedance of Limit Level for ambient VOCs, ammonia and H_2S at the monitoring locations	• Identify the source(s) and investigate the cause(s) of exceedance • Prepare the Notification of Exceedance within 24 hours • Inform Contractor, IEC, Project Proponent and EPD (EIAO Authority) whether the cause of exceedance is due to the Project • Discuss with Contractor and IEC for remedial measures • Ensure remedial measures are properly implemented • Assess effectiveness of Contractor's remedial measures and keep the Project Proponent and IEC informed of the	• Verify the Notification of Exceedance • Check with Contractor on the operating activities and implementation of landfill gas control measures • Discuss with ET and Contractor on proposed remedial measures • Review proposals on remedial measures • Audit the implementation of the remedial measures • Audit the effectiveness of the implemented remedial measures	• Rectify any unacceptable practice • Amend working methods as required • Implement amended working methods, if necessary

Action			
Event	**ET**	**IEC**	**Contractor**
	results • Repeat measurement to confirm finding if exceedance is due to the Project • Increase monitoring frequency to monthly and continue until the monitoring results reduce to below limit level		
Exceedance of Limit Level of stack emission of the thermal oxidizer, flares and generator	• Identify source(s) and investigate the cause(s) of exceedance • Prepare the Notification of Exceedance within 24 hours • Inform Contractor, IEC, Project Proponent and EPD (EIAO Authority) whether the cause of exceedance is due to the Project • Discuss with Contractor and IEC for remedial measures • Ensure remedial measures are properly implemented • Assess effectiveness of Contractor's remedial measures and keep the Project Proponent and IEC informed of the results • Repeat measurement to confirm finding if exceedance is due to the Project • Increase monitoring frequency to monthly when there are two consecutive exceedances and continue until the monitoring results reduce to below limit level	• Verify the Notification of Exceedance • Check with Contractor on the operating performance of the stack • Discuss with ET and Contractor on proposed remedial measures • Review proposals on remedial measures • Audit the implementation of the remedial measures • Audit the effectiveness of the implemented remedial measures	• Rectify any unacceptable performance • Amend design as required • Implement amended design, if necessary

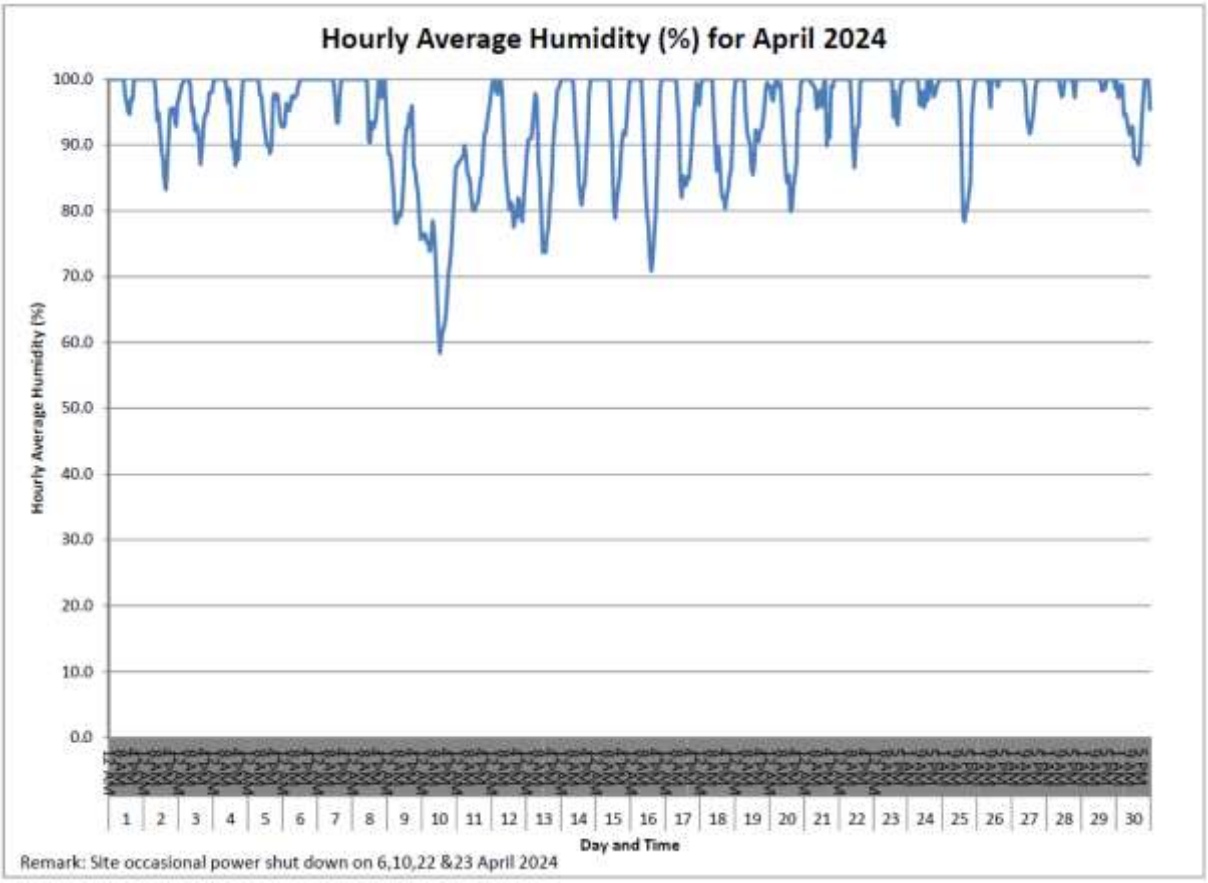
ANNEX D3 METEOROLOGICAL DATA

ANNEX D3 METEOROLOGICAL DATA

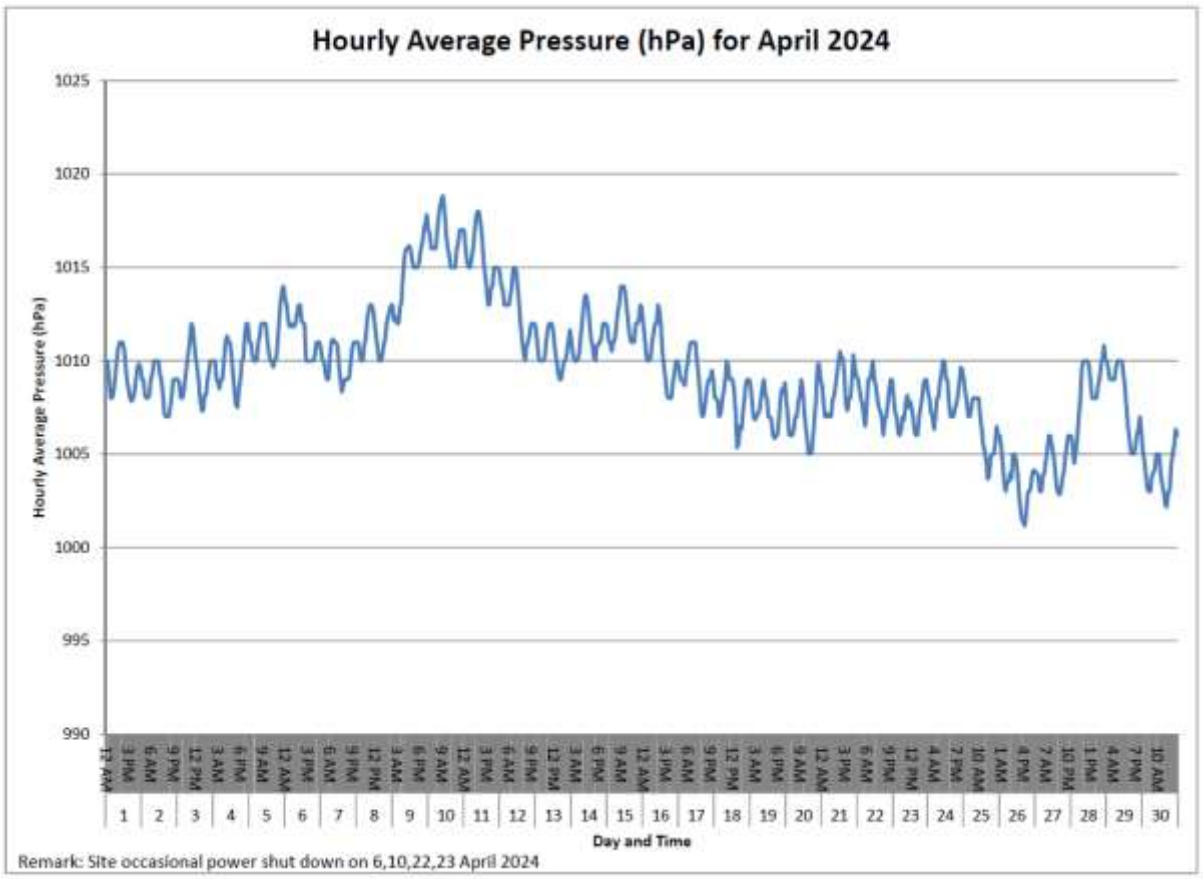
April 2024



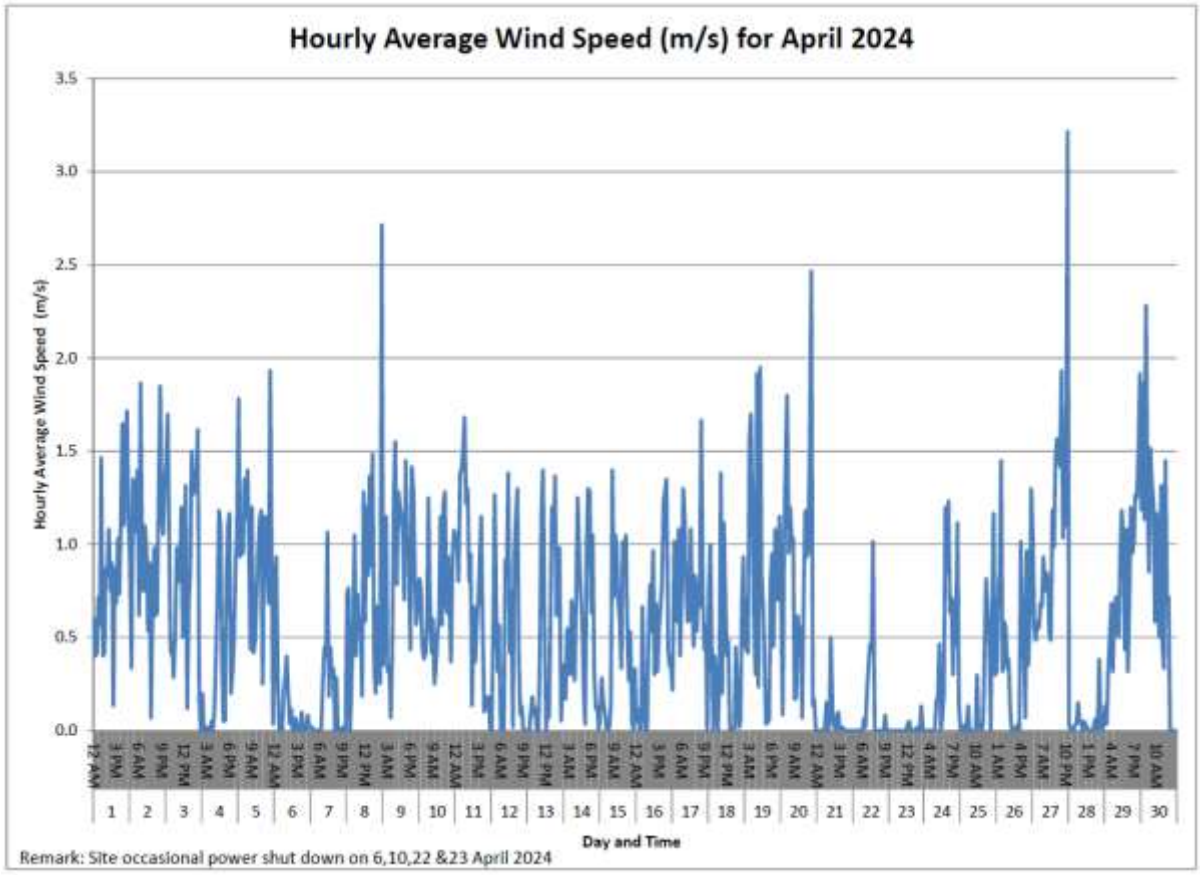
Remark: Site occasional power shut down on6,10,22 &23 April 2024



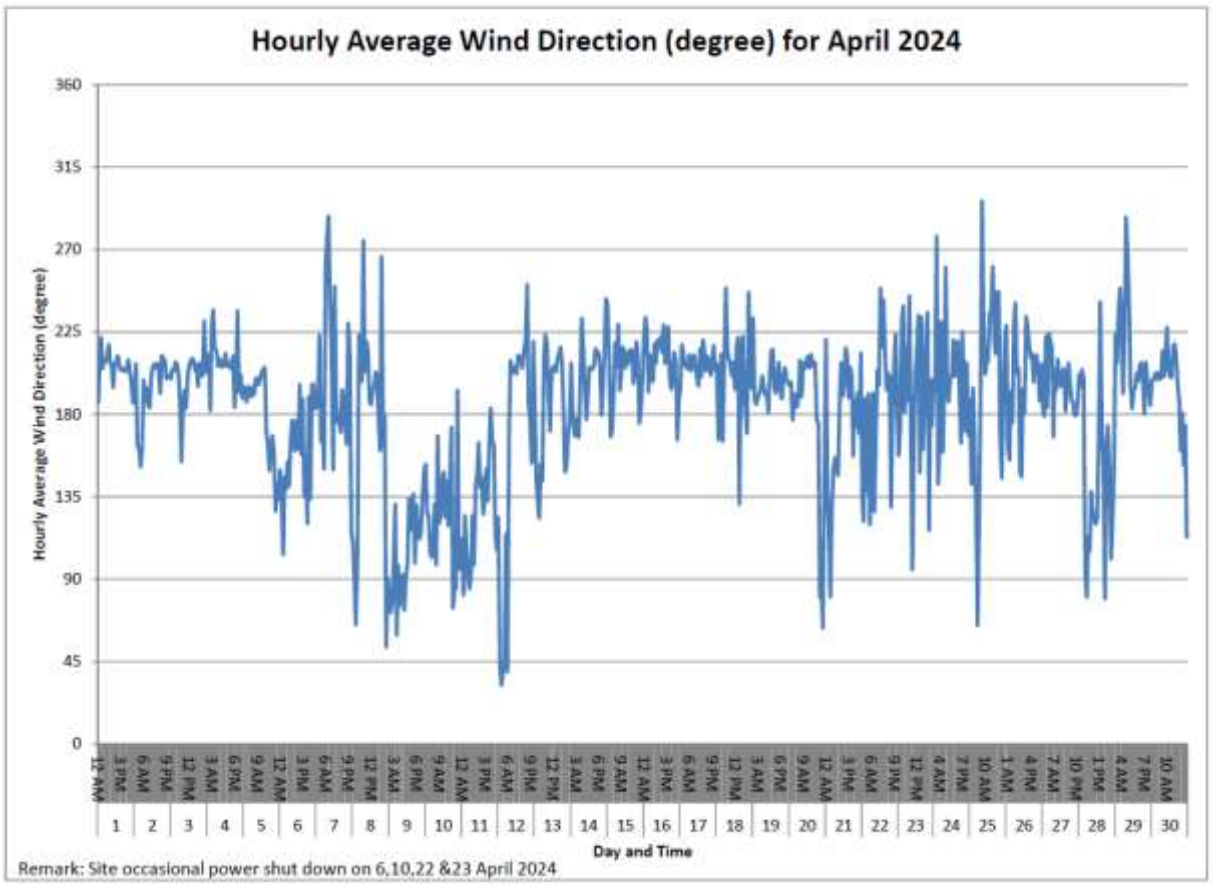
Remark: Site occasional power shut down on 6,10,22 &23 April 2024



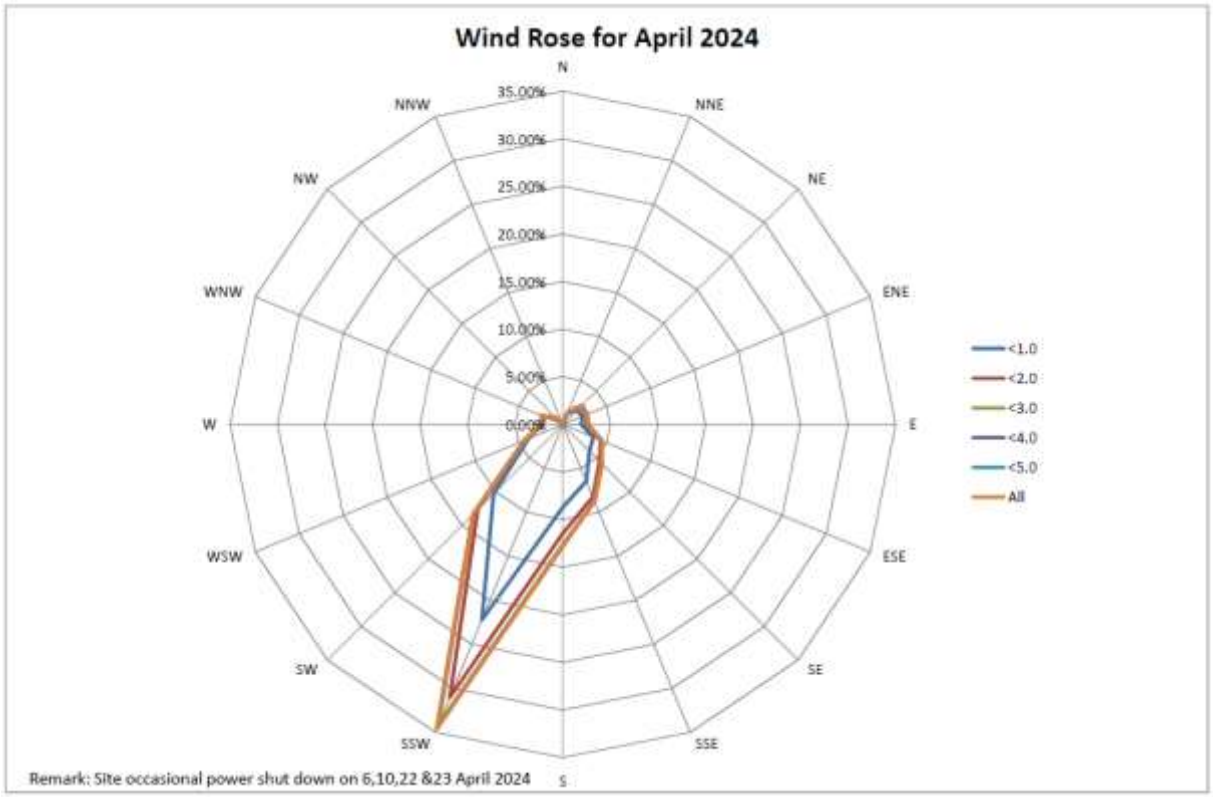
Remark: Site occasional power shut down on 6,10,22,23 April 2024



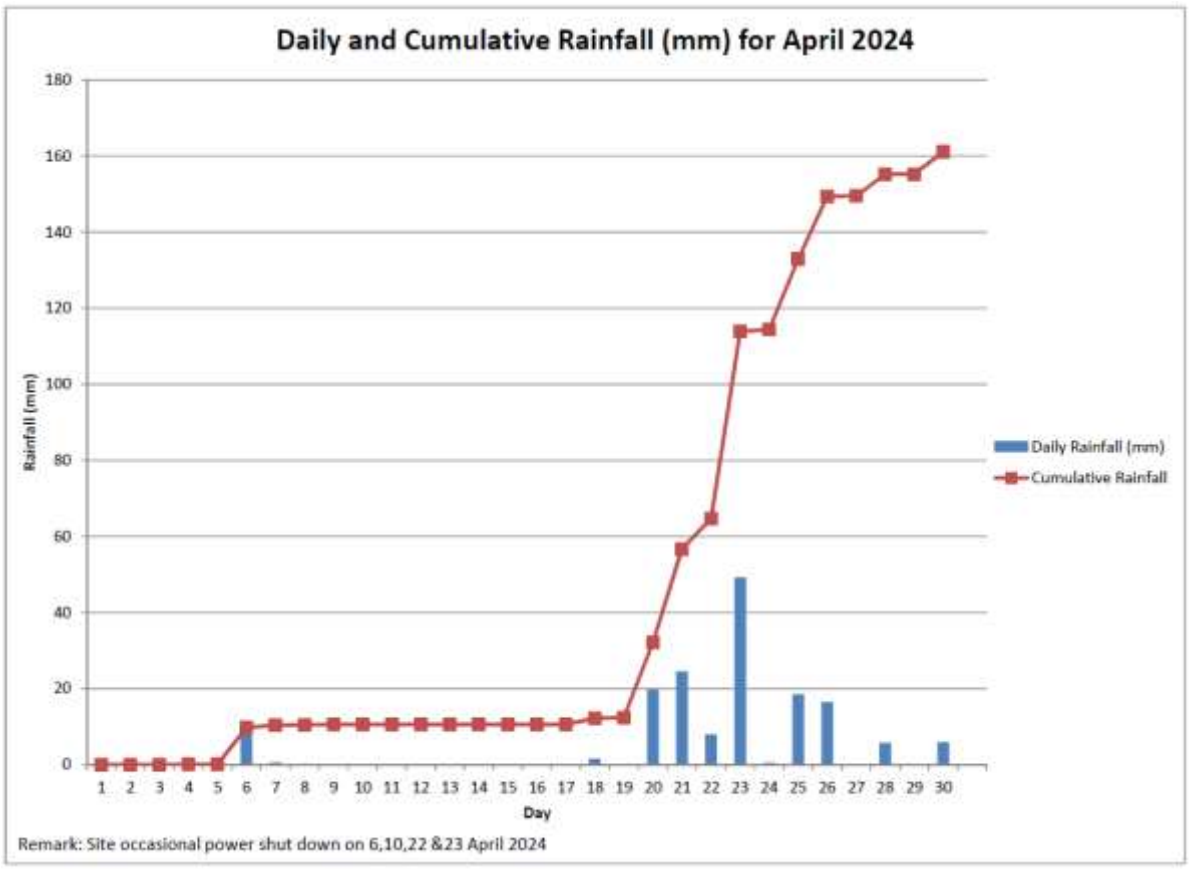
Remark: Site occasional power shut down on 6,10,22 &23 April 2024



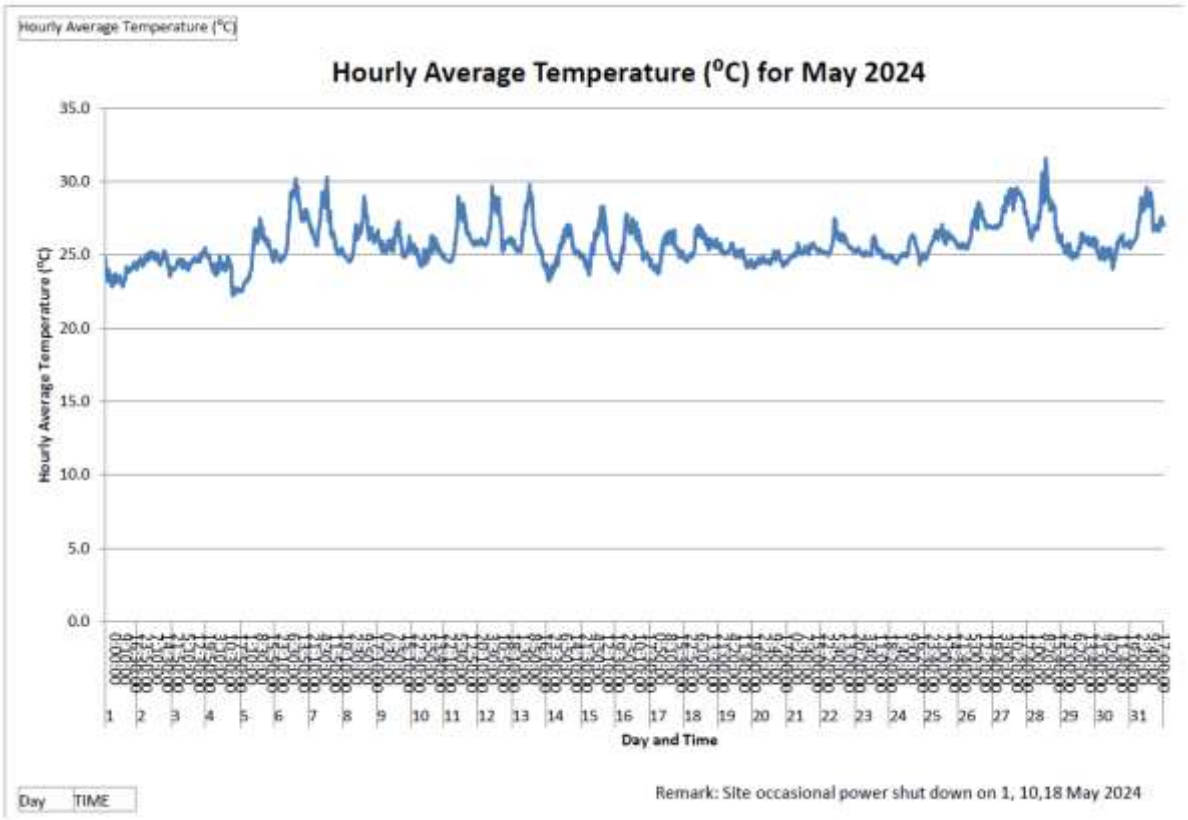
Remark: Site occasional power shut down on 6,10,22 &23 April 2024

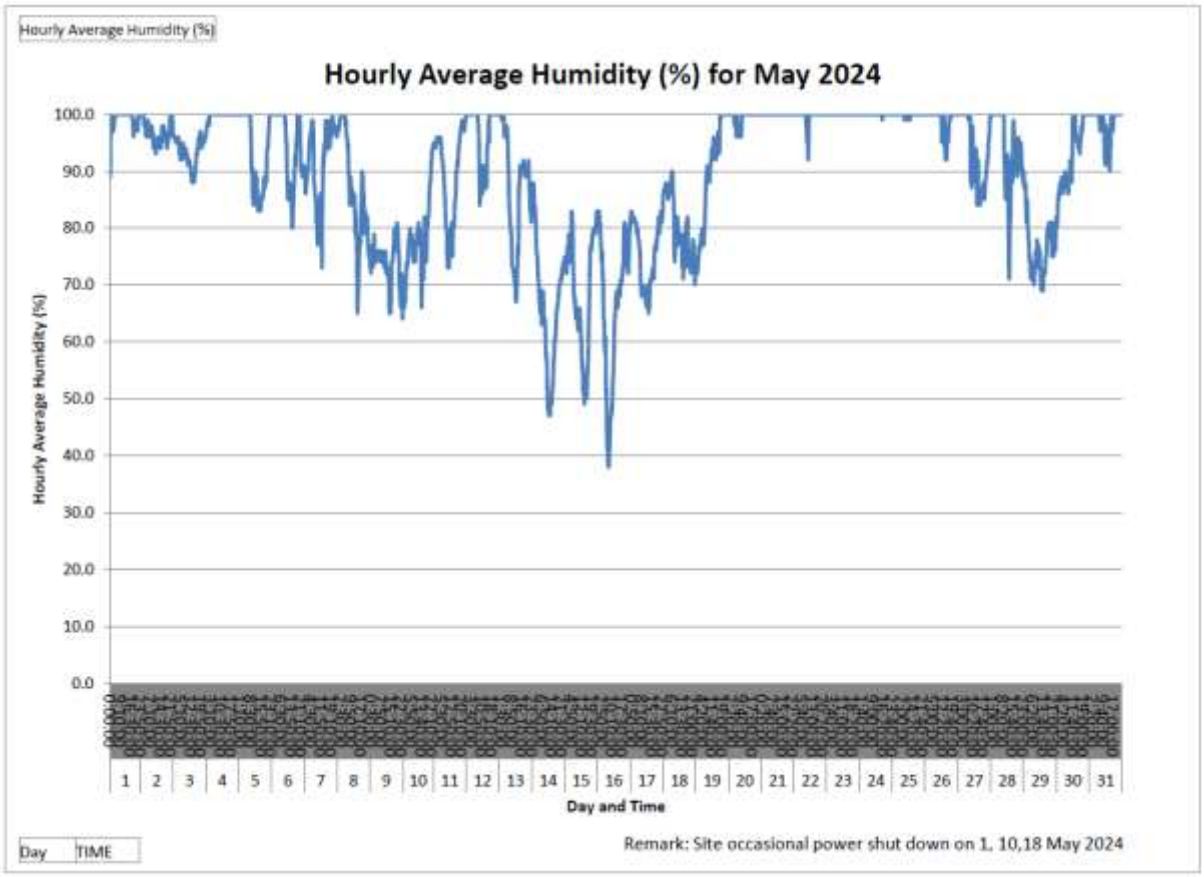


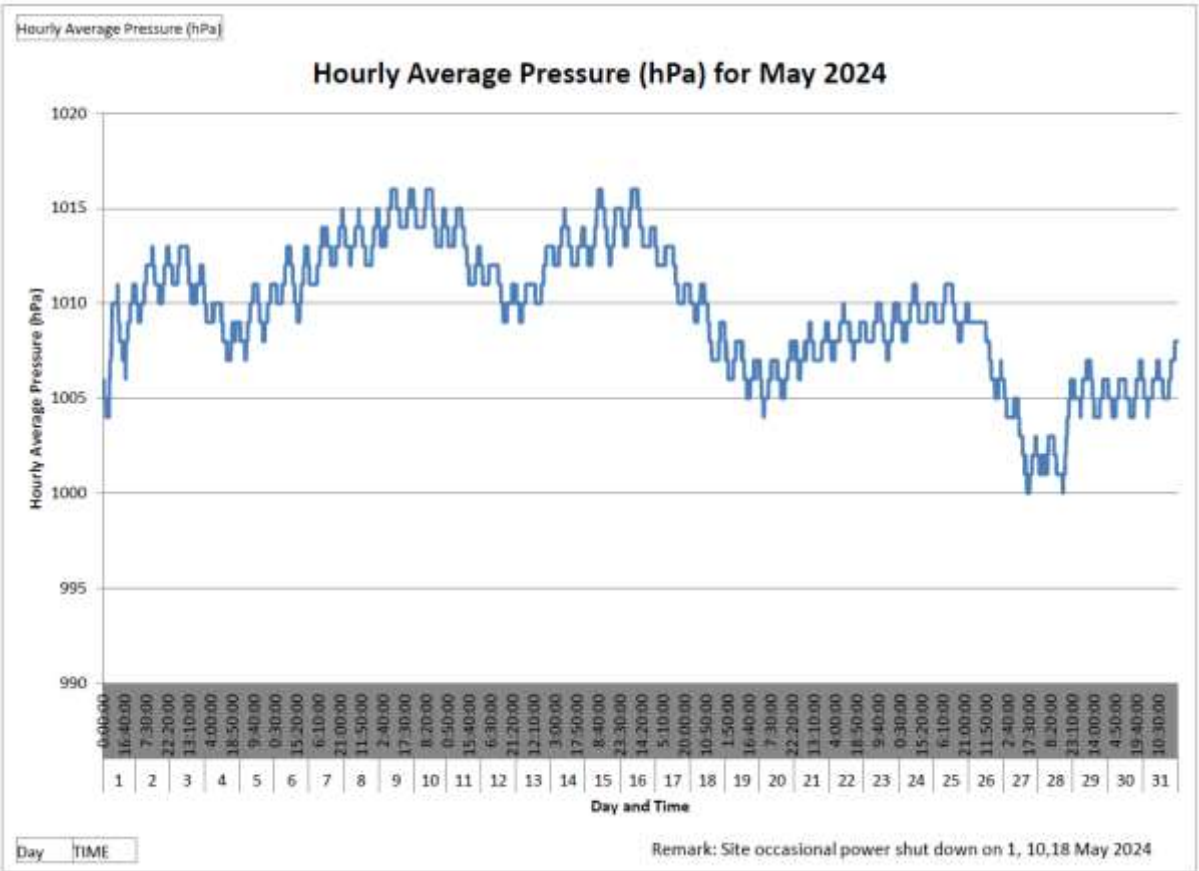
Remark: Site occasional power shut down on 6,10,22 &23 April 2024

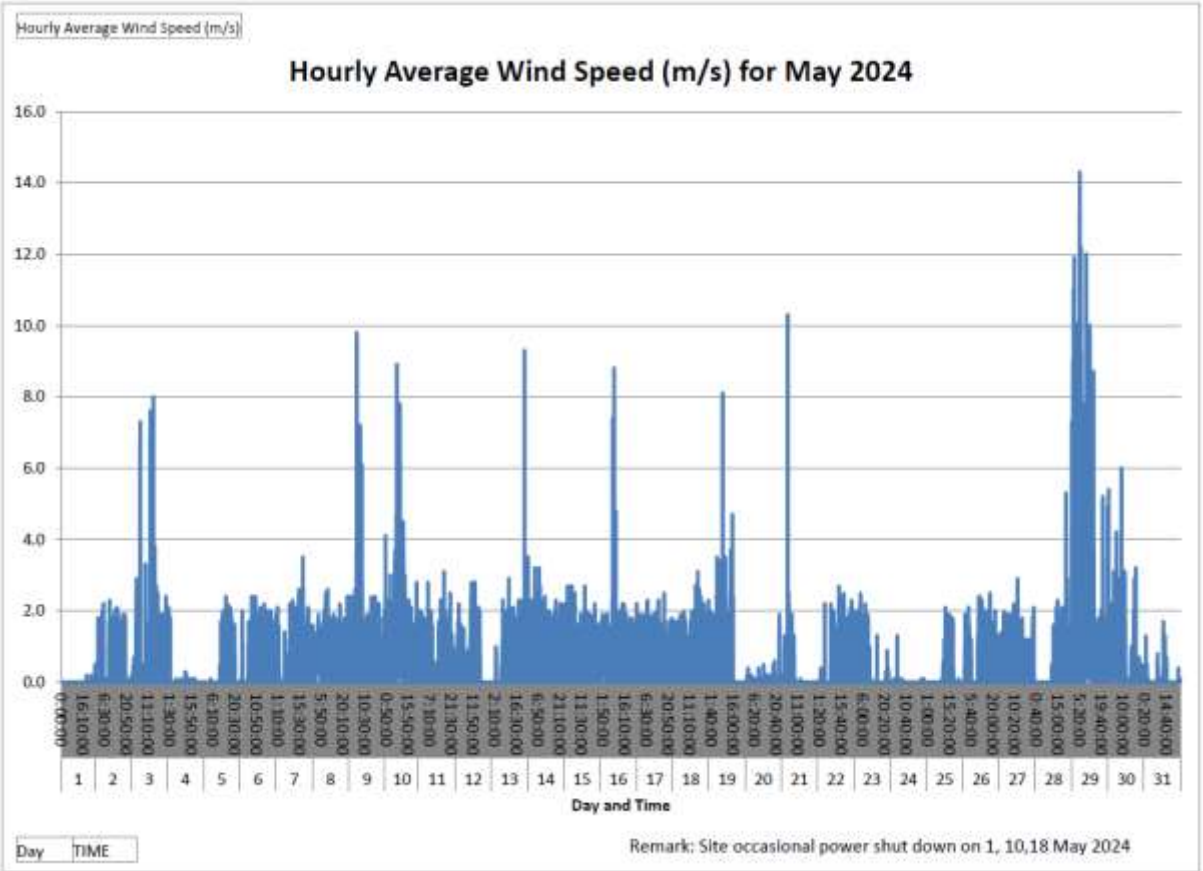

Daily and Cumulative Rainfall (mm) for April 2024
Rainfall (mm)
180
160
140
120
100
80
60
40
20
0
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30
Day
Daily Rainfall (mm)
Cumulative Rainfall
Remark: Site occasional power shut down on 6,10,22 &23 April 2024

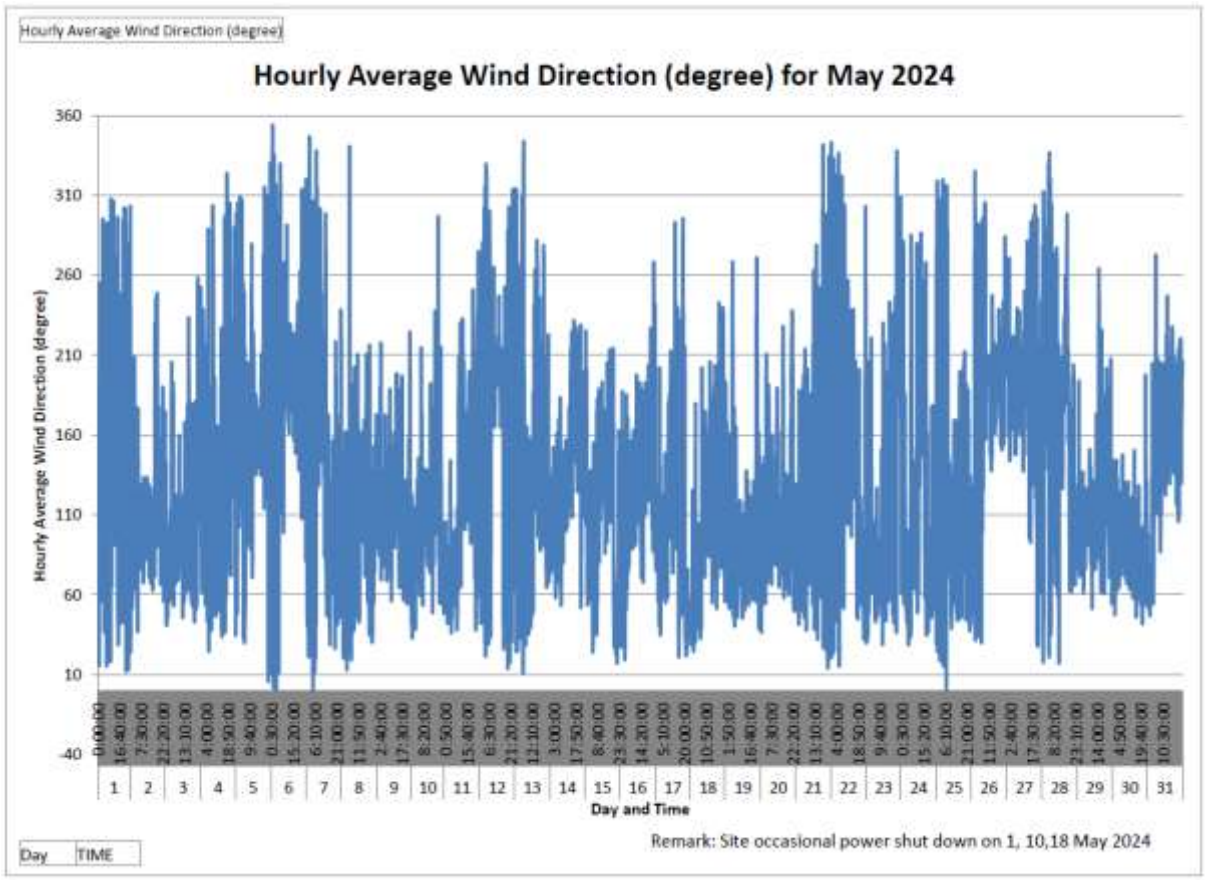
May 2024

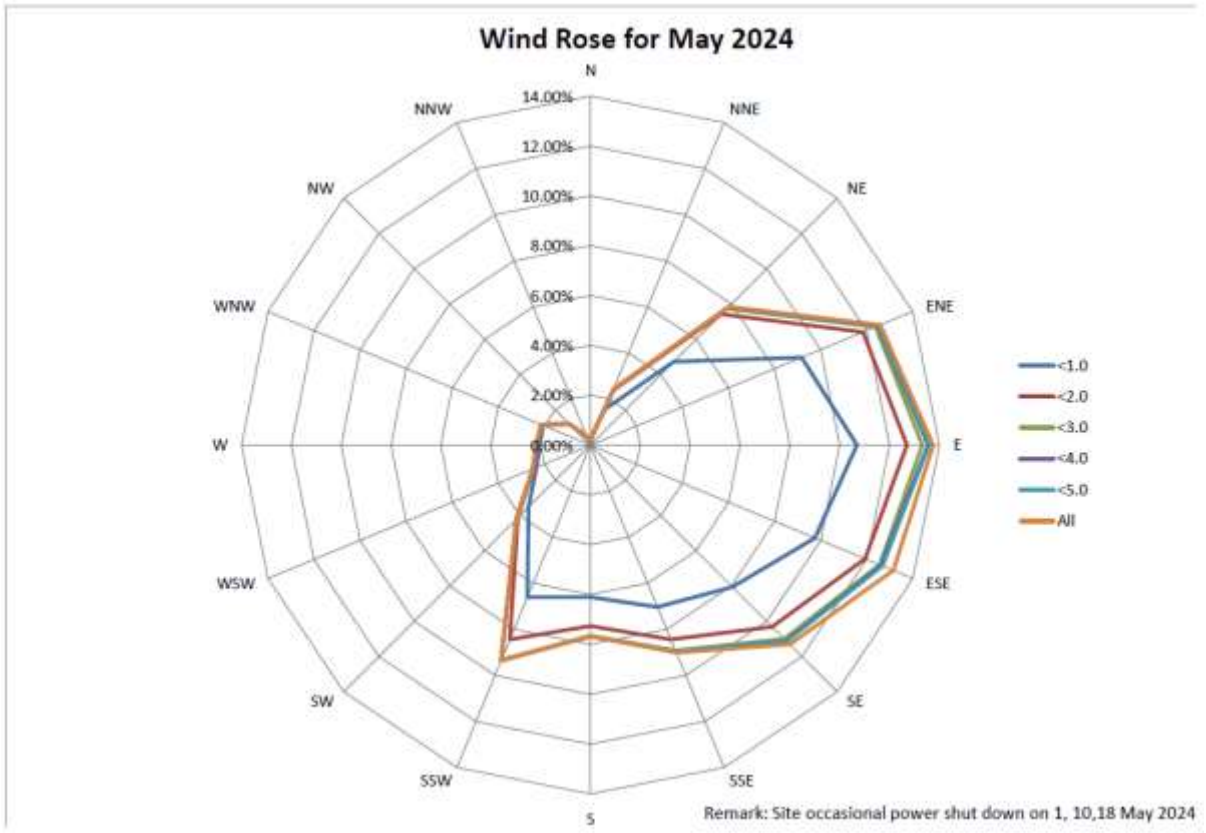

Hourly Average Temperature (°C)
Hourly Average Temperature (°C) for May 2024
35.0
30.0
25.0
20.0
15.0
10.0
5.0
0.0
Hourly Average Temperature (°C)
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31
Day and Time
Day TIME
Remark: Site occasional power shut down on 1, 10,18 May 2024

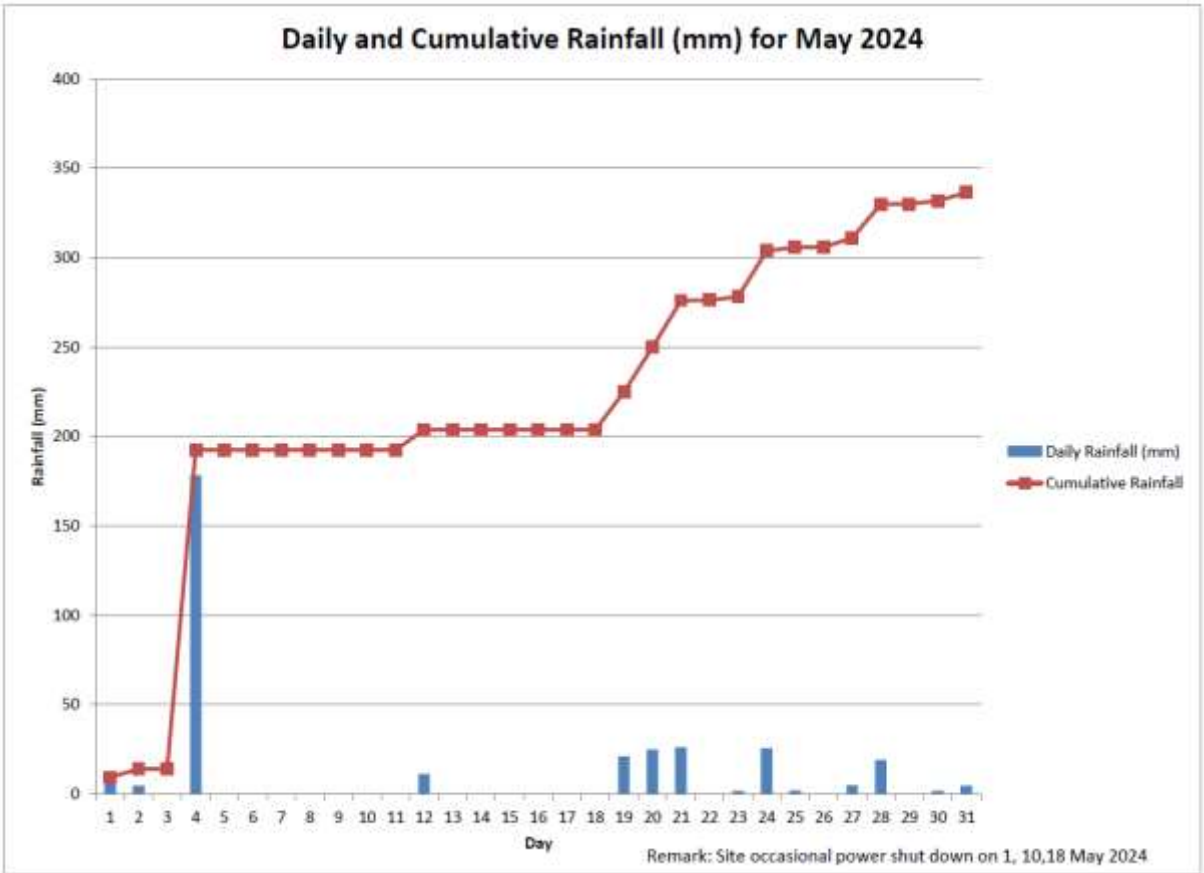

Hourly Average Humidity (%)
Hourly Average Humidity (%) for May 2024
100.0
90.0
80.0
70.0
60.0
50.0
40.0
30.0
20.0
10.0
0.0
Hourly Average Humidity (%)
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31
Day and Time
Day TIME
Remark: Site occasional power shut down on 1, 10,18 May 2024


Hourly Average Pressure (hPa)
Hourly Average Pressure (hPa) for May 2024
Hourly Average Pressure (hPa)
1020
1015
1010
1005
1000
995
990
Day and Time
Day
TIME
Remark: Site occasional power shut down on 1, 10,18 May 2024

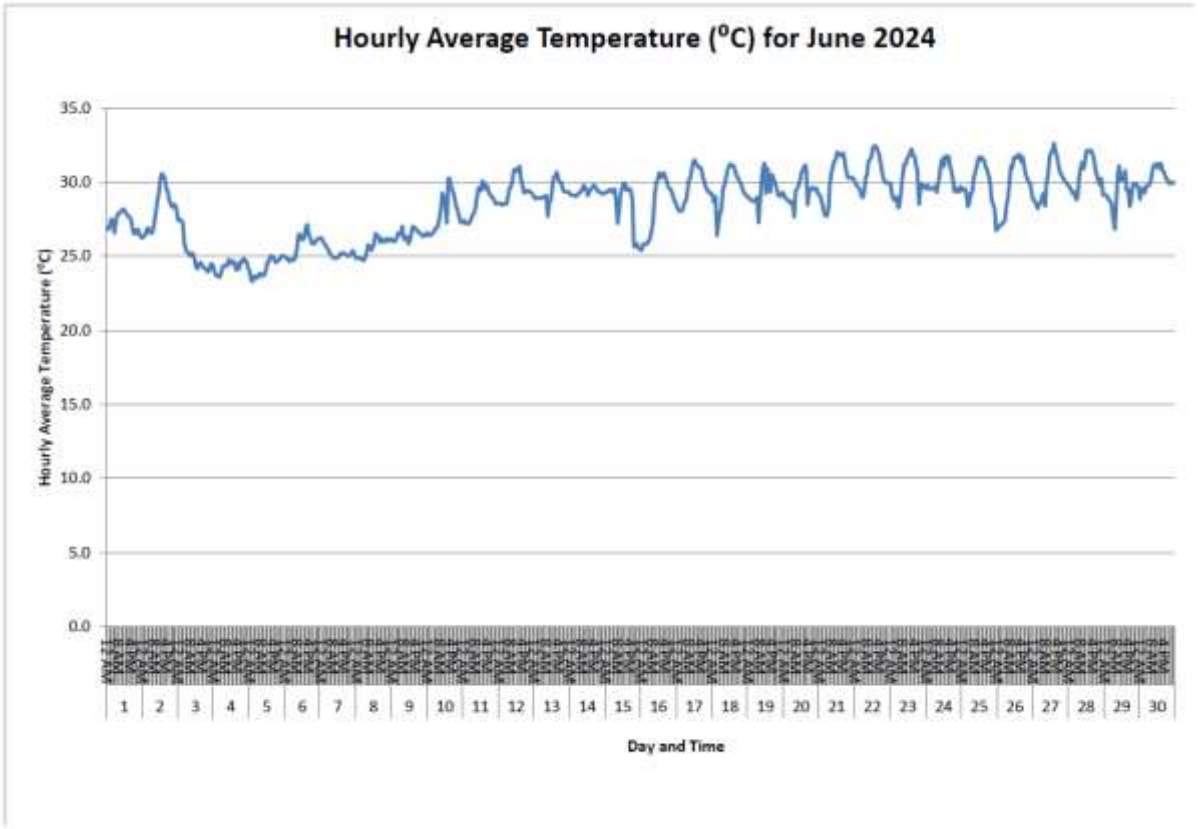

Hourly Average Wind Speed (m/s)
Hourly Average Wind Speed (m/s) for May 2024
16.0
14.0
12.0
10.0
8.0
6.0
4.0
2.0
0.0
Day and Time
Day
TIME
Remark: Site occasional power shut down on 1, 10,18 May 2024

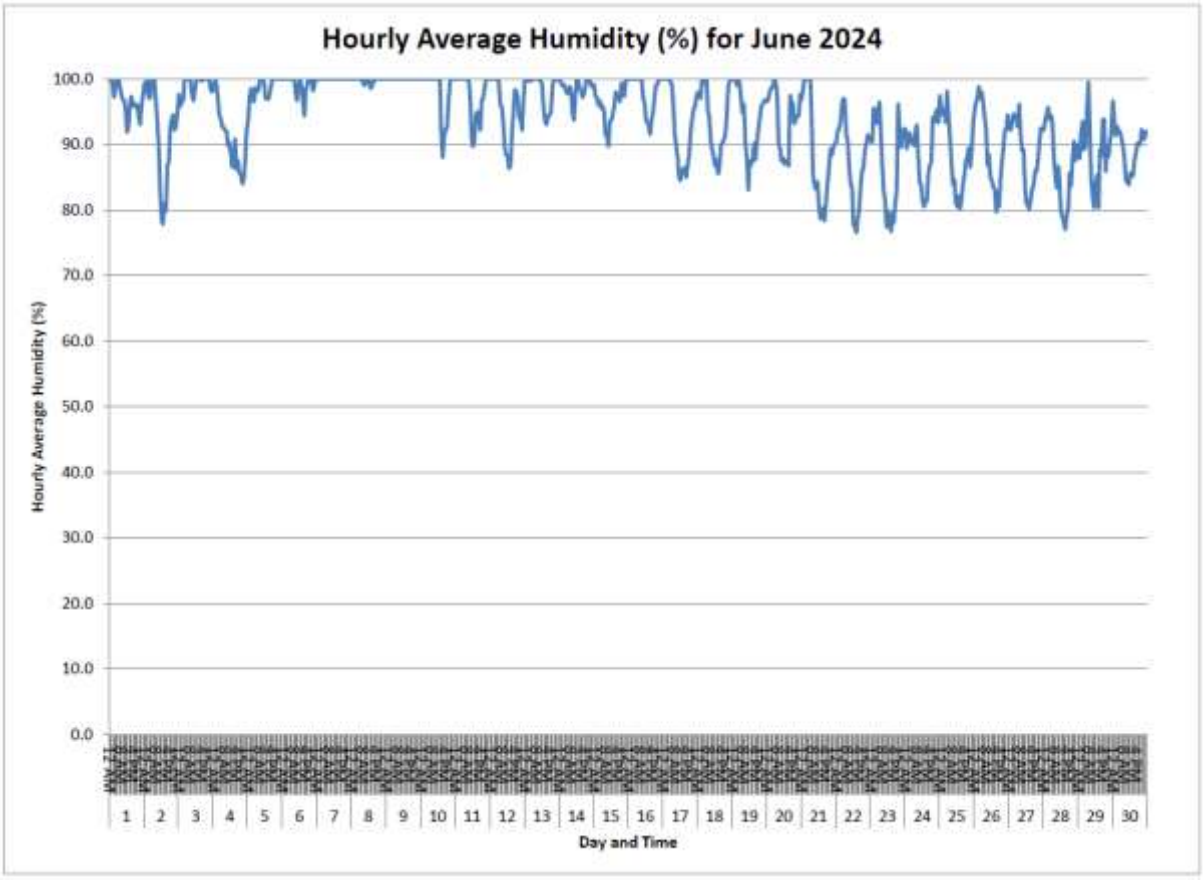

Hourly Average Wind Direction (degree)
Hourly Average Wind Direction (degree) for May 2024
Hourly Average Wind Direction (degree)
360
310
260
210
160
110
60
10
-40
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31
Day and Time
Day
TIME
Remark: Site occasional power shut down on 1, 10,18 May 2024

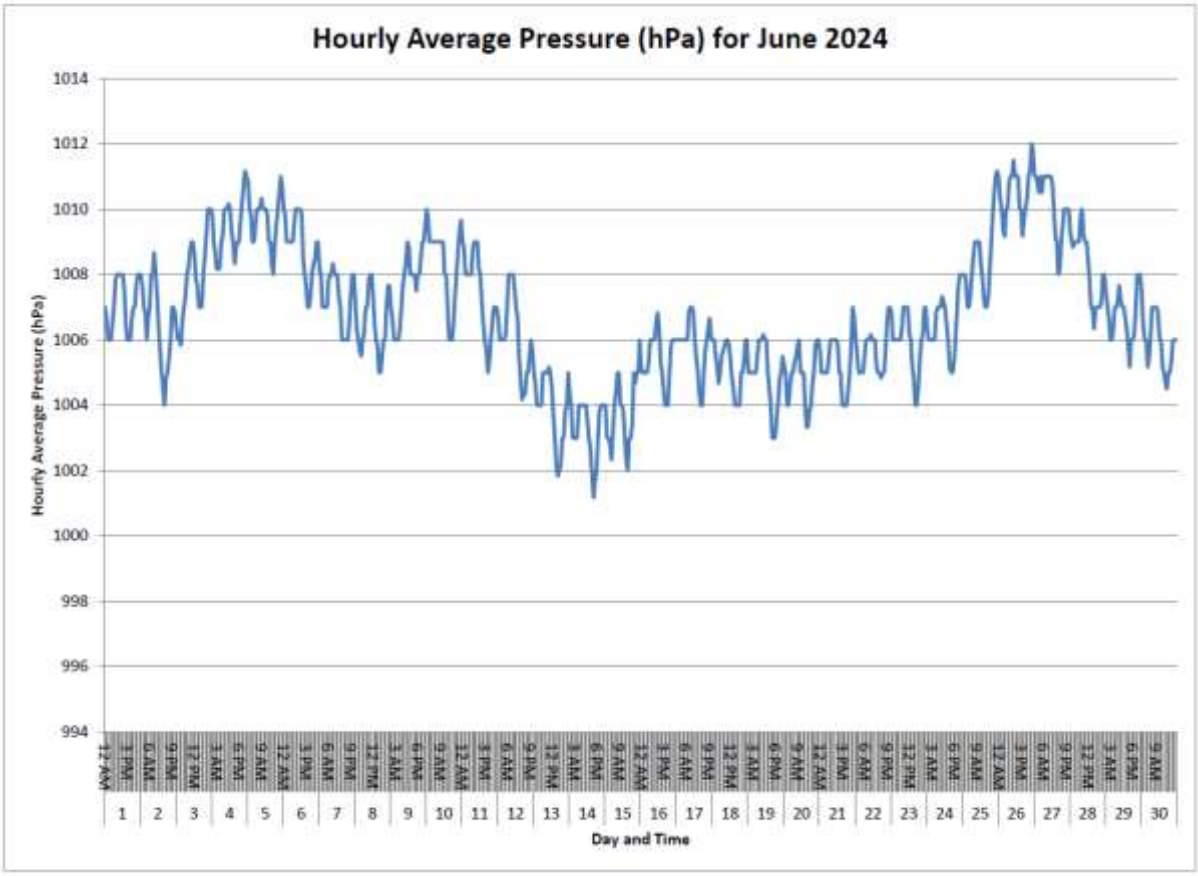

Wind Rose for May 2024
N
NNE
NE
ENE
E
ESE
SE
SSE
S
SSW
SW
WSW
W
WNW
NW
NNW
14.00%
12.00%
10.00%
8.00%
6.00%
4.00%
2.00%
0.00%
<1.0
<2.0
<3.0
<4.0
<5.0
All
Remark: Site occasional power shut down on 1, 10,18 May 2024

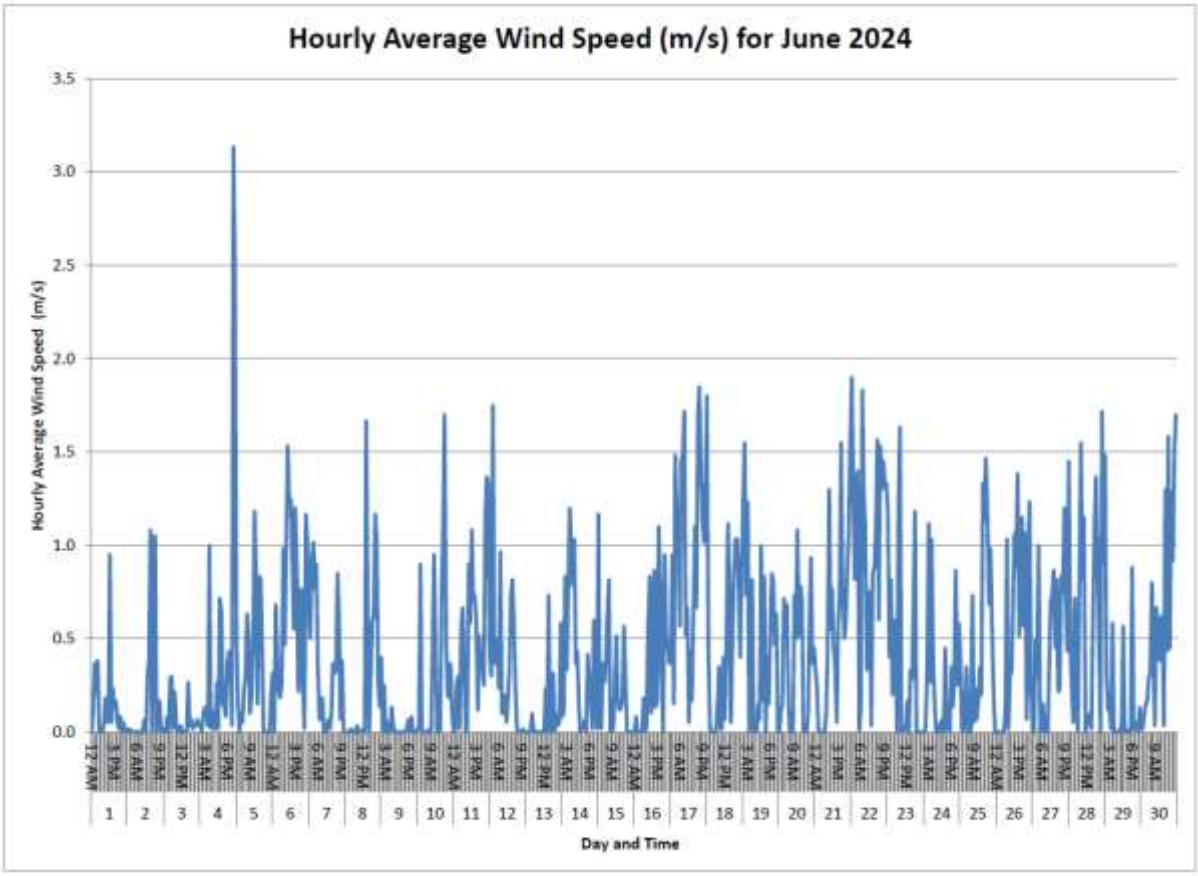

Daily and Cumulative Rainfall (mm) for May 2024
Rainfall (mm)
400
350
300
250
200
150
100
50
0
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31
Day
Daily Rainfall (mm)
Cumulative Rainfall
Remark: Site occasional power shut down on 1, 10,18 May 2024

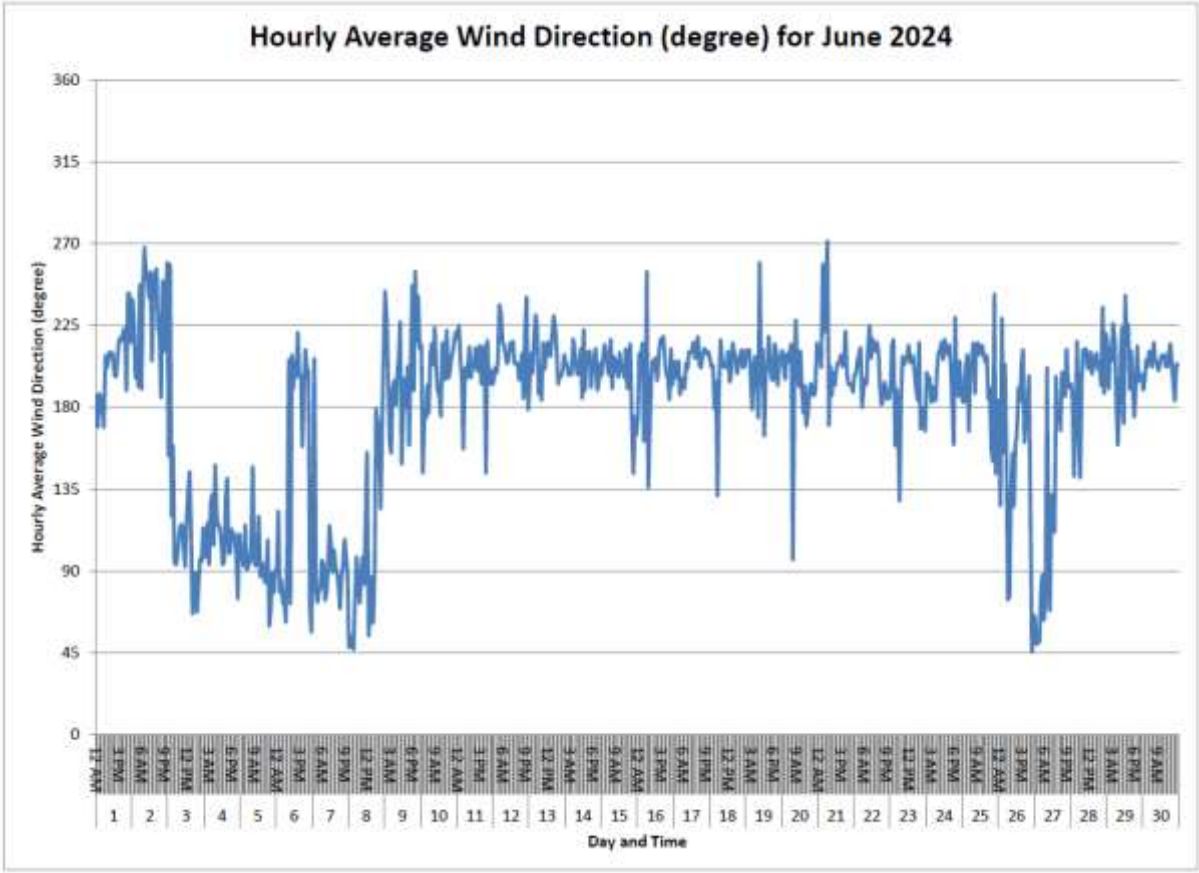
June 2024

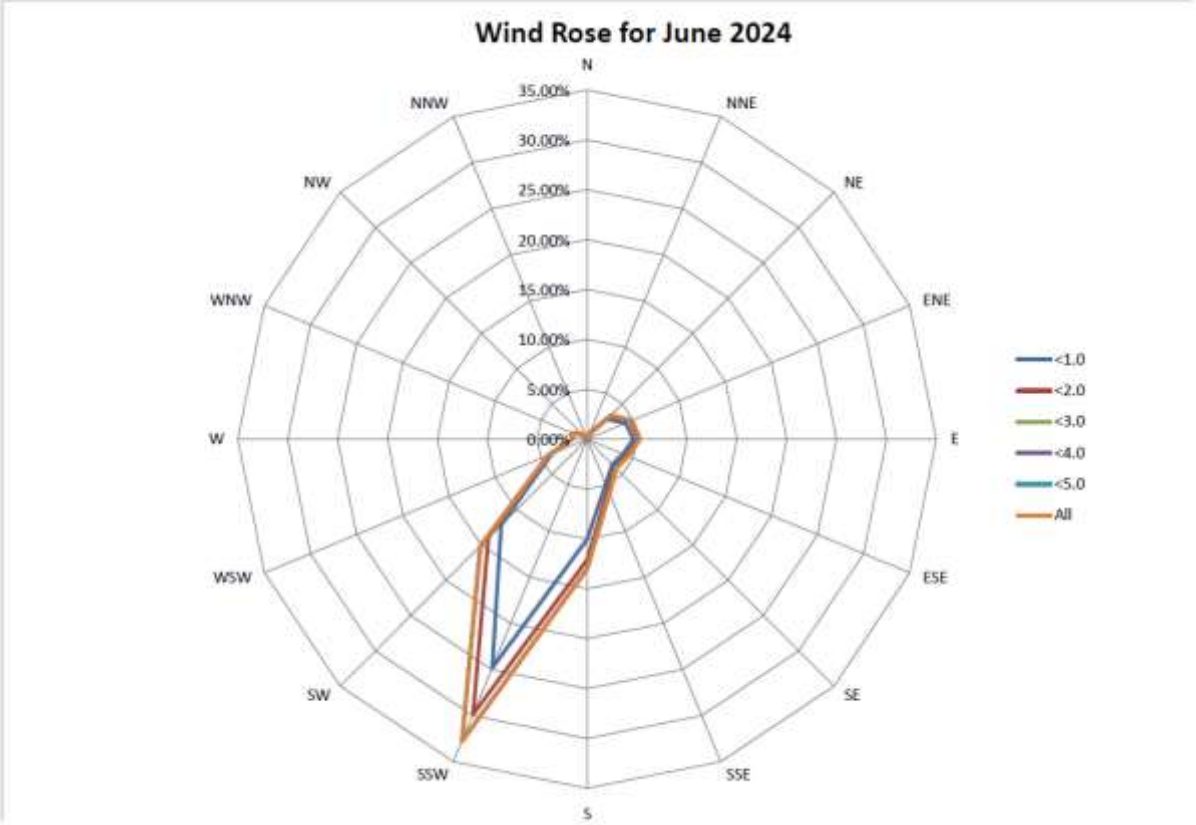

Hourly Average Temperature (°C) for June 2024
Hourly Average Temperature (°C)
35.0
30.0
25.0
20.0
15.0
10.0
5.0
0.0
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30
Day and Time

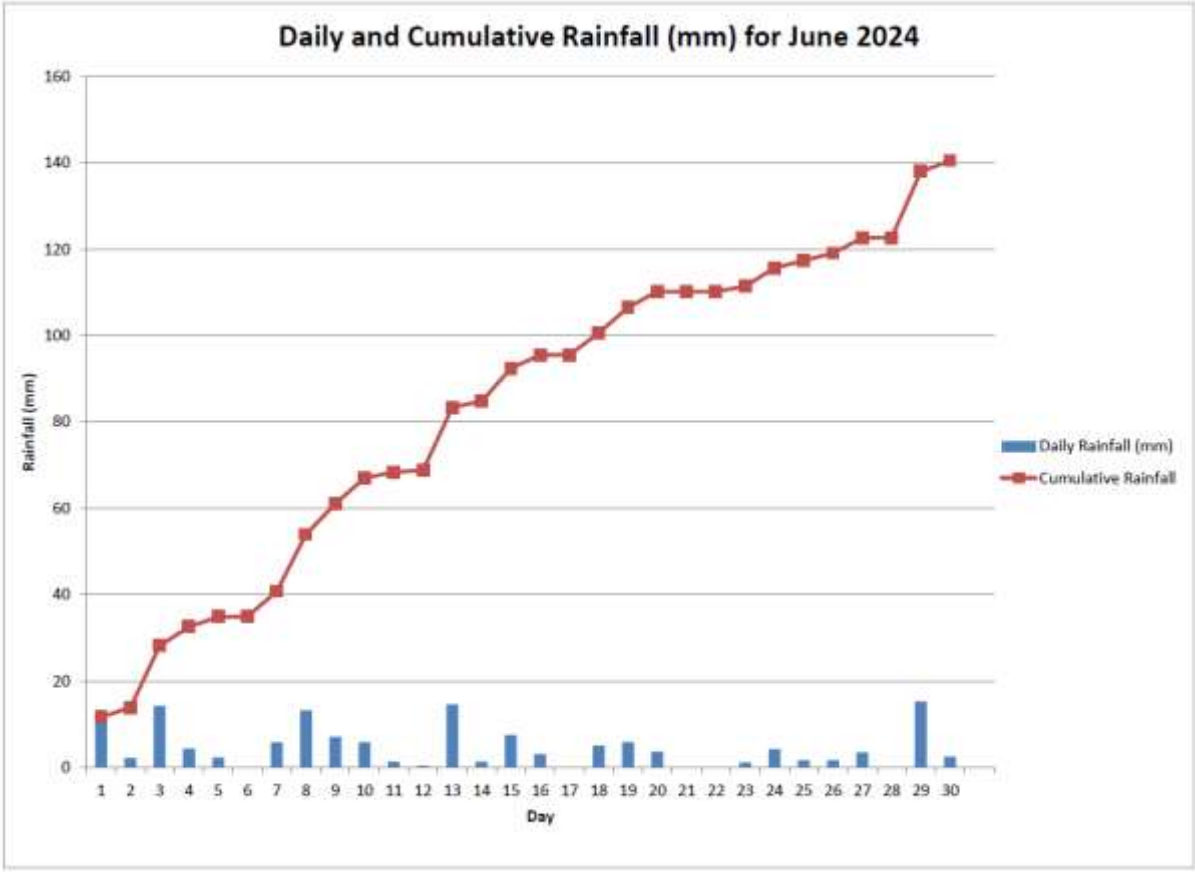

Hourly Average Humidity (%) for June 2024
Hourly Average Humidity (%)
100.0
90.0
80.0
70.0
60.0
50.0
40.0
30.0
20.0
10.0
0.0
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30
Day and Time


Hourly Average Pressure (hPa) for June 2024
Hourly Average Pressure (hPa)
1014
1012
1010
1008
1006
1004
1002
1000
998
996
994
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30
Day and Time


Hourly Average Wind Speed (m/s) for June 2024
Hourly Average Wind Speed (m/s)
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30
Day and Time


Hourly Average Wind Direction (degree) for June 2024
Hourly Average Wind Direction (degree)
360
315
270
225
180
135
90
45
0
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30
Day and Time


Wind Rose for June 2024
N
NNE
NE
ENE
E
ESE
SE
SSE
S
SSW
SW
WSW
W
WNW
NW
NNW
35.00%
30.00%
25.00%
20.00%
15.00%
10.00%
5.00%
0.00%
<1.0
<2.0
<3.0
<4.0
<5.0
All


Daily and Cumulative Rainfall (mm) for June 2024
Rainfall (mm)
160
140
120
100
80
60
40
20
0
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30
Day
Daily Rainfall (mm)
Cumulative Rainfall

ANNEX D4 ODOUR MONITORING RESULTS

ANNEX D4 ODOUR MONITORING RESULTS

Date	Weather	Location	Time	Temperature (°C)	Wind Speed (m/s)	Wind Direction	From Project Site	Odour Intensity	Odour Characteristic	Possible Source	Remarks
24 Apr 24	Rainy	OP1	14:41	24.3	0.3	N	Yes	0	N/A	N/A	N/A
24 Apr 24	Rainy	OP2	14:49	24.6	1.5	SE	No	0	N/A	N/A	N/A
24 Apr 24	Rainy	OP3	14:52	25.5	0.0	N/A	No	0	N/A	N/A	N/A
24 Apr 24	Rainy	OP4	14:54	25.7	1.0	W	No	0	N/A	N/A	N/A
24 Apr 24	Rainy	OP5	14:56	25.5	0.0	N/A	No	0	N/A	N/A	N/A
24 Apr 24	Rainy	OP6	14:58	26.0	1.8	W	No	0	N/A	N/A	N/A
24 Apr 24	Rainy	OP7	14:59	25.6	1.3	NE	Yes	0	N/A	N/A	N/A
24 Apr 24	Rainy	OP8	15:03	25.1	0.9	NE	Yes	0	N/A	N/A	N/A
24 Apr 24	Rainy	OP9	15:10	23.8	0.4	NW	No	0	N/A	N/A	N/A
24 Apr 24	Rainy	OP10	15:12	24.3	0.3	E	Yes	0	N/A	N/A	N/A
24 Apr 24	Rainy	OP11	15:24	25.7	0.8	SE	Yes	0	N/A	N/A	N/A
24 Apr 24	Rainy	OP12	15:22	25.2	0.7	SE	Yes	1	Town gas	Town gas plant	N/A
24 Apr 24	Rainy	OP13	15:20	25.2	0.2	E	Yes	0	N/A	N/A	N/A
24 Apr 24	Rainy	OP14	15:18	23.9	1.0	NE	No	1	Waste smell	Cell 4X Tipping area	SENTx
24 Apr 24	Rainy	OP15	15:48	25.7	0.0	N/A	No	0	N/A	N/A	N/A

Date	Weather	Location	Time	Temperature (°C)	Wind Speed (m/s)	Wind Direction	From Project Site	Odour Intensity	Odour Characteristic	Possible Source	Remarks
24 Apr 24	Rainy	OP16	15:45	25.7	0.0	N/A	No	0	N/A	N/A	N/A
24 Apr 24	Rainy	OP17 [(a)]	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	No safety access (e.g. soil too wet)
21 May 24	Rainy	OP1	10:10	25.0	3.8	N	Yes	0	N/A	N/A	N/A
21 May 24	Rainy	OP2	10:05	24.0	2.0	N	Yes	0	N/A	N/A	N/A
21 May 24	Rainy	OP3	10:18	24.9	1.1	SW	No	0	N/A	N/A	N/A
21 May 24	Rainy	OP4	10:20	25.4	0.2	W	No	0	N/A	N/A	N/A
21 May 24	Rainy	OP5	10:22	25.5	1.2	E	No	0	N/A	N/A	N/A
21 May 24	Rainy	OP6	10:24	25.3	3.2	NE	Yes	0	N/A	N/A	N/A
21 May 24	Rainy	OP7	10:27	24.4	1.6	N	No	0	N/A	N/A	N/A
21 May 24	Rainy	OP8	10:31	25.4	2.0	SE	Yes	0	N/A	N/A	N/A
21 May 24	Rainy	OP9	10:35	25.7	1.4	NE	Yes	0	N/A	N/A	N/A
21 May 24	Rainy	OP10	10:37	24.9	3.3	SE	Yes	0	N/A	N/A	N/A
21 May 24	Rainy	OP11	10:54	24.8	2.2	E	Yes	1	Waste smell	Cell 4X Tipping area	SENTx

Date	Weather	Location	Time	Temperature (°C)	Wind Speed (m/s)	Wind Direction	From Project Site	Odour Intensity	Odour Characteristic	Possible Source	Remarks
21 May 24	Rainy	OP12	10:51	24.5	2.8	E	Yes	1	Waste smell	Cell 4X Tipping area	SENTx
21 May 24	Rainy	OP13	10:48	24.6	3.6	E	No	0	N/A	N/A	N/A
21 May 24	Rainy	OP14	10:49	24.6	2.6	E	No	0	N/A	N/A	N/A
21 May 24	Rainy	OP15 [a]	N/A	N/A	N/A	N/A	N/A	0	N/A	N/A	No safety access (e.g. soil too wet)
21 May 24	Rainy	OP16 [a]	N/A	N/A	N/A	N/A	N/A	0	N/A	N/A	No safety access (e.g. soil too wet)
21 May 24	Rainy	OP17 [a]	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	No safety access (e.g. soil too wet)
18 Jun 24	Sunny	OP1	14:13	31.0	2.2	S	No	0	N/A	0	N/A
18 Jun 24	Sunny	OP2	14:16	30.7	1.5	S	No	0	N/A	0	N/A
18 Jun 24	Sunny	OP3	14:19	31.5	0.8	SW	No	0	N/A	0	N/A
18 Jun 24	Sunny	OP4	14:21	31.3	0.7	SW	No	0	N/A	0	N/A
18 Jun 24	Sunny	OP5	14:23	31.4	0.0	N/A	No	0	N/A	0	N/A

Date	Weather	Location	Time	Temperature (°C)	Wind Speed (m/s)	Wind Direction	From Project Site	Odour Intensity	Odour Characteristic	Possible Source	Remarks
18 Jun 24	Sunny	OP6	14:25	32.1	0.4	SE	No	0	N/A	0	N/A
18 Jun 24	Sunny	OP7	14:26	32.1	0.7	SE	No	0	N/A	0	N/A
18 Jun 24	Sunny	OP8	14:30	31.2	1.7	SW	No	0	N/A	0	N/A
18 Jun 24	Sunny	OP9	14:35	32.0	0.4	SE	No	0	N/A	0	N/A
18 Jun 24	Sunny	OP10	14:38	32.6	1.0	SE	Yes	1	Town gas smell	Town gas Plant	N/A
18 Jun 24	Sunny	OP11	14:45	32.4	3.9	S	No	1	Waste smell	Cell 4X Tipping area	SENTx
18 Jun 24	Sunny	OP12	15:10	28.8	1.6	SW	Yes	1	Grass smell	Vegetation	N/A
18 Jun 24	Sunny	OP13	15:03	28.1	4.7	SW	Yes	0	N/A	0	N/A
18 Jun 24	Sunny	OP14	14:57	29.1	7.1	SW	Yes	0	N/A	0	N/A
18 Jun 24	Sunny	OP15	15:36	30.4	2.2	SE	Yes	0	N/A	0	N/A
18 Jun 24	Sunny	OP16	15:33	31.2	0.4	SE	No	0	N/A	0	N/A
18 Jun 24	Sunny	OP17	15:29	31.1	3.4	SW	No	0	N/A	0	N/A

Note:
(a) OP15 was not accessible due to safety considerations in April 2024, and OP15 – OP17 were not accessible due to safety considerations in May 2024.

ANNEX D5 THERMAL OXIDIZER, LANDFILL GAS FLARE AND LANDFILL GAS GENERATOR STACK EMISSION MONITORING RESULTS

TABLE D5.1 THERMAL OXIDISER STACK EMISSION MONITORING RESULTS

Parameters	**Monitoring Results (April 2024)**
NO_2	1.58 gs^{-1}
CO	0.02 gs^{-1}
SO_2	0.01 gs^{-1}
Benzene	$<1.0 \times 10^{-4}$ gs^{-1}
Vinyl chloride	$<1.0 \times 10^{-4}$ gs^{-1}
Exhaust gas velocity	8.4 ms^{-1}
Parameters	**Monitoring Results (May 2024)**
NO_2	1.18 gs^{-1}
CO	0.03 gs^{-1}
SO_2	0.01 gs^{-1}
Benzene	$<2.0 \times 10^{-4}$ gs^{-1}
Vinyl chloride	$<1.3 \times 10^{-4}$ gs^{-1}
Non-Methane Organic Carbons	<0.003 gs^{-1}
Ammonia	0.0232 gs^{-1}
Exhaust gas velocity	9.3 ms^{-1}
Parameters	**Monitoring Results (June 2024)**
NO_2	0.90 gs^{-1}
CO	0.02 gs^{-1}
SO_2	<0.01 gs^{-1}
Benzene	$<2.0 \times 10^{-4}$ gs^{-1}
Vinyl chloride	$<1.2 \times 10^{-4}$ gs^{-1}
Exhaust gas velocity	10.0 ms^{-1}

TABLE D5.2 THERMAL OXIDISER STACK CONTINUOUS MONITORING RESULTS

Date	Gas Combustion Temperature (°C)	Exhaust Temperature (K)	Exhaust Gas Velocity (ms^{-1}) (a)
1 Apr 24	925	1233	8.4
2 Apr 24	927	1232	
3 Apr 24	923	1231	
4 Apr 24	926	1228	
5 Apr 24	927	1214	
6 Apr 24	924	1234	
7 Apr 24	925	1234	
8 Apr 24	916	1231	
9 Apr 24	902	1217	
10 Apr 24	901	1215	
11 Apr 24	906	1220	
12 Apr 24	901	1224	
13 Apr 24	902	1222	
14 Apr 24	903	1225	
15 Apr 24	901	1225	
16 Apr 24	899	1225	
17 Apr 24	898	1225	
18 Apr 24	900	1221	
19 Apr 24	903	1226	
20 Apr 24	900	1222	
21 Apr 24	900	1222	
22 Apr 24	901	1221	
23 Apr 24	897	1224	
24 Apr 24	897	1225	
25 Apr 24	899	1228	
26 Apr 24	898	1221	
27 Apr 24	899	1226	
28 Apr 24	896	1220	
29 Apr 24	904	1223	
30 Apr 24	901	1232	
1 May 24	900	1226	
2 May 24	896	1227	
3 May 24	903	1228	
4 May 24	906	1224	
5 May 24	898	1213	
6 May 24	899	1222	

Date	Gas Combustion Temperature (°C)	Exhaust Temperature (K)	Exhaust Gas Velocity (ms^{-1}) (a)
7 May 24	900	1225	9.3
8 May 24	903	1227	
9 May 24	897	1224	
10 May 24	900	1225	
11 May 24	899	1228	
12 May 24	904	1230	
13 May 24	900	1214	
14 May 24	897	1226	
15 May 24	900	1229	
16 May 24	899	1228	
17 May 24	899	1232	
18 May 24	896	1226	
19 May 24	895	1225	
20 May 24	900	1227	
21 May 24	897	1227	
22 May 24	901	1227	
23 May 24	903	1232	
24 May 24	902	1225	
25 May 24	903	1224	
26 May 24	900	1225	
27 May 24	907	1229	
28 May 24	903	1224	
29 May 24	901	1220	
30 May 24	900	1217	
1 Jun 24	897	1223	
2 Jun 24	903	1225	
3 Jun 24	907	1219	
4 Jun 24	Under maintenance		
5 Jun 24	Under maintenance		
6 Jun 24	Under maintenance		
7 Jun 24	Under maintenance		
8 Jun 24	Under maintenance		
9 Jun 24	Under maintenance		
10 Jun 24	Under maintenance		
11 Jun 24	Under maintenance		
12 Jun 24	Under maintenance		
13 Jun 24	Under maintenance		

Date	Gas Combustion Temperature (°C)	Exhaust Temperature (K)	Exhaust Gas Velocity (ms^{-1}) (a)
14 Jun 24	Under maintenance		10.0
15 Jun 24	Under maintenance		
16 Jun 24	Under maintenance		
17 Jun 24	Under maintenance		
18 Jun 24	Under maintenance		
19 Jun 24	Under maintenance		
20 Jun 24	Under maintenance		
21 Jun 24	Under maintenance		
22 Jun 24	Under maintenance		
23 Jun 24	Under maintenance		
24 Jun 24	900	1215	
25 Jun 24	898	1221	
26 Jun 24	897	1217	
27 Jun 24	898	1214	
28 Jun 24	899	1213	
29 Jun 24	900	1210	
30 Jun 24	902	1213	
Average	903	1224	9.2
Min	894	1210	8.4
Max	927	1234	10.0

Notes:

(a) The exhaust gas velocity was calculated based on the cross-section area of the stack and the gas flow and combustion temperature data measured during the stack emission monitoring.

TABLE D5.3 LANDFILL GAS FLARE STACK EMISSION MONITORING RESULTS

Parameters	**Monitoring Results (April 2024)**
	Flare 1 – F601
NO_2	0.03 gs^{-1}
CO	2.61 gs^{-1}
SO_2	0.08 gs^{-1}
Benzene	6.479 x 10^{-3} gs^{-1}
Vinyl chloride	<1.14 x 10^{-4} gs^{-1}
Exhaust gas velocity	9.8 ms^{-1}
Parameters	**Monitoring Results (May 2024)**
	Flare 1 – F601
NO_2	0.02 gs^{-1}
CO	0.02 gs^{-1}
SO_2	0.06 gs^{-1}
Benzene	6.73 x 10^{-4} gs^{-1}
Vinyl chloride	<1.01 x 10^{-4} gs^{-1}
Non-Methane Organic Carbons	<0.002 gs^{-1}
Exhaust gas velocity	8.9 ms^{-1}
Parameters	**Monitoring Results (June 2024)**
	Flare 1 – F601
NO_2	0.02 gs^{-1}
CO	0.02 gs^{-1}
SO_2	0.05 gs^{-1}
Benzene	<1.21 x 10^{-4} gs^{-1}
Vinyl chloride	<9.7 x 10^{-5} gs^{-1}
Exhaust gas velocity	9.1 ms^{-1}

TABLE D5.4 LANDFILL GAS FLARE STACK CONTINUOUS MONITORING RESULTS

Date	Gas Combustion Temperature (°C)	Exhaust Temperature (K)	Exhaust Gas Velocity (ms^{-1}) (a)	Operation Status
Flare 1 – F601				
1 Apr 24	821	1082	9.8	In Operation
2 Apr 24	854	1121		In Operation
3 Apr 24	859	1124		In Operation
4 Apr 24	884	1147		In Operation
5 Apr 24	840	1099		In Operation
6 Apr 24	888	1146		In Operation
7 Apr 24	847	1108		In Operation
8 Apr 24	885	1151		In Operation
9 Apr 24	851	1118		In Operation
10 Apr 24	828	1090		In Operation
11 Apr 24	835	1100		In Operation
12 Apr 24	852	1096		In Operation
13 Apr 24	851	1119		In Operation
14 Apr 24	855	1115		In Operation
15 Apr 24	871	1115		In Operation
16 Apr 24	867	1129		In Operation
17 Apr 24	872	1134		In Operation
18 Apr 24	871	1132		In Operation
19 Apr 24	862	1115		In Operation
20 Apr 24	892	1158		In Operation
21 Apr 24	864	1119		In Operation
22 Apr 24	842	1100		In Operation
23 Apr 24	858	1119		In Operation
24 Apr 24	857	1100		In Operation
25 Apr 24	860	1120		In Operation
26 Apr 24	875	1130		In Operation
27 Apr 24	889	1121		In Operation
28 Apr 24	870	1132		In Operation
29 Apr 24	882	1144		In Operation
30 Apr 24	883	1142		In Operation
1 May 24	826	1087		In Operation
2 May 24	862	1126		In Operation
3 May 24	860	1131		In Operation
4 May 24	886	1157		In Operation
5 May 24	843	1105		In Operation

Date	Gas Combustion Temperature (°C)	Exhaust Temperature (K)	Exhaust Gas Velocity (ms^{-1}) (a)	Operation Status
6 May 24	897	1147		In Operation
7 May 24	855	1118		In Operation
8 May 24	891	1156		In Operation
9 May 24	854	1125		In Operation
10 May 24	832	1100		In Operation
11 May 24	845	1101		In Operation
12 May 24	860	1102		In Operation
13 May 24	857	1124		In Operation
14 May 24	857	1124		In Operation
15 May 24	877	1125	8.9	In Operation
16 May 24	869	1130		In Operation
17 May 24	880	1142		In Operation
18 May 24	878	1141		In Operation
19 May 24	872	1125		In Operation
20 May 24	895	1159		In Operation
21 May 24	873	1120		In Operation
22 May 24	848	1105		In Operation
23 May 24	860	1120		In Operation
24 May 24	862	1104		In Operation
25 May 24	864	1126		In Operation
26 May 24	884	1140		In Operation
27 May 24	898	1126		In Operation
28 May 24	872	1138		In Operation
29 May 24	885	1151		In Operation
30 May 24	893	1151		In Operation
31 May 24	845	1105		In Operation
1 Jun 24	839	1106		In Operation
2 Jun 24	876	1140		In Operation
3 Jun 24	868	1136		In Operation
4 Jun 24	896	1164		In Operation
5 Jun 24	840	1108		In Operation
6 Jun 24	899	1164		In Operation
7 Jun 24	867	1130		In Operation
8 Jun 24	888	1151		In Operation
9 Jun 24	868	1131		In Operation
10 Jun 24	836	1102		In Operation
11 Jun 24	850	1115	9.1	In Operation

Date	Gas Combustion Temperature (°C)	Exhaust Temperature (K)	Exhaust Gas Velocity (ms^{-1}) (a)	Operation Status
12 Jun 24	866	1129		In Operation
13 Jun 24	861	1124		In Operation
14 Jun 24	868	1135		In Operation
15 Jun 24	891	1158		In Operation
16 Jun 24	867	1132		In Operation
17 Jun 24	895	1162		In Operation
18 Jun 24	883	1149		In Operation
19 Jun 24	868	1134		In Operation
20 Jun 24	904	1168		In Operation
21 Jun 24	879	1143		In Operation
22 Jun 24	861	1127		In Operation
23 Jun 24	874	1137		In Operation
24 Jun 24	859	1122		In Operation
25 Jun 24	863	1126		In Operation
26 Jun 24	890	1156		In Operation
27 Jun 24	907	1173		In Operation
28 Jun 24	875	1139		In Operation
29 Jun 24	882	1145		In Operation
30 Jun 24	906	1171		In Operation
Average	868	1129	9.3	
Min	821	1082	8.9	
Max	907	1173	9.8	
Flare 2 – F602				
1 Apr 24	854	1106		In Operation
2 Apr 24	881	1141		In Operation
3 Apr 24	893	1159		In Operation
4 Apr 24	934	1187		In Operation
5 Apr 24	870	1138		In Operation
6 Apr 24	925	1179		In Operation
7 Apr 24	874	1131		In Operation
8 Apr 24	928	1185		In Operation
9 Apr 24	872	1127		In Operation
10 Apr 24	858	1116		In Operation
11 Apr 24	870	1130		In Operation
12 Apr 24	880	1121		In Operation
13 Apr 24	895	1154		In Operation
14 Apr 24	883	1147	9.8	In Operation

Date	Gas Combustion Temperature (°C)	Exhaust Temperature (K)	Exhaust Gas Velocity (ms^{-1}) [a]	Operation Status
15 Apr 24	908	1139		In Operation
16 Apr 24	892	1154		In Operation
17 Apr 24	910	1174		In Operation
18 Apr 24	907	1156		In Operation
19 Apr 24	898	1139		In Operation
20 Apr 24	915	1179		In Operation
21 Apr 24	889	1147		In Operation
22 Apr 24	871	1129		In Operation
23 Apr 24	882	1140		In Operation
24 Apr 24	887	1127		In Operation
25 Apr 24	899	1158		In Operation
26 Apr 24	901	1150		In Operation
27 Apr 24	913	1155		In Operation
28 Apr 24	900	1166		In Operation
29 Apr 24	921	1181		In Operation
30 Apr 24	913	1171		In Operation
1 May 24	857	1109		In Operation
2 May 24	881	1142		In Operation
3 May 24	895	1159		In Operation
4 May 24	936	1189		In Operation
5 May 24	874	1137		In Operation
6 May 24	925	1181		In Operation
7 May 24	879	1136		In Operation
8 May 24	931	1188		In Operation
9 May 24	877	1132		In Operation
10 May 24	856	1117		In Operation
11 May 24	872	1128		In Operation
12 May 24	878	1122		In Operation
13 May 24	893	1157		In Operation
14 May 24	881	1151		In Operation
15 May 24	909	1137		In Operation
16 May 24	895	1153		In Operation
17 May 24	909	1172		In Operation
18 May 24	911	1157		In Operation
19 May 24	899	1144		In Operation
20 May 24	916	1179		In Operation
21 May 24	888	1150	8.9	In Operation

Date	Gas Combustion Temperature (°C)	Exhaust Temperature (K)	Exhaust Gas Velocity (ms^{-1}) (a)	Operation Status
22 May 24	869	1130		In Operation
23 May 24	885	1141		In Operation
24 May 24	890	1131		In Operation
25 May 24	901	1159		In Operation
26 May 24	901	1152		In Operation
27 May 24	914	1158		In Operation
28 May 24	905	1171		In Operation
29 May 24	926	1179		In Operation
30 May 24	914	1173		In Operation
31 May 24	904	1169		In Operation
1 Jun 24	868	1136		In Operation
2 Jun 24	886	1153		In Operation
3 Jun 24	892	1159		In Operation
4 Jun 24	951	1214		In Operation
5 Jun 24	870	1138		In Operation
6 Jun 24	930	1194		In Operation
7 Jun 24	879	1143		In Operation
8 Jun 24	940	1205		In Operation
9 Jun 24	883	1148		In Operation
10 Jun 24	856	1124		In Operation
11 Jun 24	886	1151	9.1	In Operation
12 Jun 24	875	1142		In Operation
13 Jun 24	900	1165		In Operation
14 Jun 24	892	1158		In Operation
15 Jun 24	918	1183		In Operation
16 Jun 24	899	1167		In Operation
17 Jun 24	910	1174		In Operation
18 Jun 24	925	1192		In Operation
19 Jun 24	914	1180		In Operation
20 Jun 24	929	1195		In Operation
21 Jun 24	884	1151		In Operation
22 Jun 24	866	1131		In Operation
23 Jun 24	884	1149		In Operation
24 Jun 24	888	1156		In Operation
25 Jun 24	914	1177		In Operation
26 Jun 24	906	1170		In Operation
27 Jun 24	928	1191		In Operation

Date	Gas Combustion Temperature (°C)	Exhaust Temperature (K)	Exhaust Gas Velocity (ms^{-1}) (a)	Operation Status
28 Jun 24	909	1172		In Operation
29 Jun 24	926	1191		In Operation
30 Jun 24	921	1188		In Operation
Average	897	1156	9.3	
Min	854	1106	8.9	
Max	951	1214	9.8	

Notes:

(a) The exhaust gas velocity was calculated based on the cross-section area of the stack and the gas flow and combustion temperature data measured during the stack emission monitoring.

TABLE D5.5 LANDFILL GAS GENERATOR STACK EMISSION MONITORING RESULTS

Parameters	**Monitoring Results (April 2024)**
NO_2	0.101 gs^{-1}
CO	1.193 gs^{-1}
SO_2	<0.001 gs^{-1}
Benzene	1.3 x 10^{-4} gs^{-1}
Vinyl chloride	<1.07 x 10^{-5} gs^{-1}
Exhaust gas velocity	9.7 ms^{-1}
Parameters	**Monitoring Results (May 2024)**
NO_2	0.084 gs^{-1}
CO	0.808 gs^{-1}
SO_2	<0.001 gs^{-1}
Benzene	5.6 x 10^{-5} gs^{-1}
Vinyl chloride	<1.04 x 10^{-5} gs^{-1}
Non-Methane Organic Carbons	0.0037 gs^{-1}
Exhaust gas velocity	10.0 ms^{-1}
Parameters	**Monitoring Results (June 2024)**
NO_2	0.043 gs^{-1}
CO	0.711 gs^{-1}
SO_2	<0.001 gs^{-1}
Benzene	5.5 x 10^{-5} gs^{-1}
Vinyl chloride	<9.6 x 10^{-6} gs^{-1}
Non-Methane Organic Carbons	10.2 ms^{-1}
(a) The Landfill Gas Generator was under maintenance in the reporting period	

TABLE D5.6 LANDFILL GAS GENERATOR STACK CONTINUOUS MONITORING RESULTS

Date	Exhaust temperature (K)	Exhaust gas velocity (ms^{-1}) [a]	Operation Status (Landfill Gas Generator in Operation)
ENGA			
1 Apr 24	852		In Operation
2 Apr 24	852		In Operation
3 Apr 24	854		In Operation
4 Apr 24	855		In Operation
5 Apr 24	891		In Operation
6 Apr 24	-		Under Maintenance
7 Apr 24	-		Under Maintenance
8 Apr 24	-		Under Maintenance
9 Apr 24	-		Under Maintenance
10 Apr 24	-		Under Maintenance
11 Apr 24	-		Under Maintenance
12 Apr 24	-		Under Maintenance
13 Apr 24	-		Under Maintenance
14 Apr 24	-		Under Maintenance
15 Apr 24	-		Under Maintenance
16 Apr 24	851		In Operation
17 Apr 24	852		In Operation
18 Apr 24	852		In Operation
19 Apr 24	854		In Operation
20 Apr 24	851	9.7	In Operation
21 Apr 24	853		In Operation
22 Apr 24	856		In Operation
23 Apr 24	856		In Operation
24 Apr 24	-		Under Maintenance
25 Apr 24	888		In Operation
26 Apr 24	892		In Operation
27 Apr 24	891		In Operation
28 Apr 24	889		In Operation
29 Apr 24	851		In Operation
30 Apr 24	848		In Operation
1 May 24	849		In Operation
2 May 24	854		In Operation
3 May 24	855		In Operation

Date	Exhaust temperature (K)	Exhaust gas velocity (ms^{-1}) [a]	Operation Status (Landfill Gas Generator in Operation)
4 May 24	-		Under Maintenance
5 May 24	-		Under Maintenance
6 May 24	-		Under Maintenance
7 May 24	-		Under Maintenance
8 May 24	-		Under Maintenance
9 May 24	-		Under Maintenance
10 May 24	-		Under Maintenance
11 May 24	-		Under Maintenance
12 May 24	-		Under Maintenance
13 May 24	858	10.0	In Operation
14 May 24	876		In Operation
15 May 24	-		Under Maintenance
16 May 24	-		Under Maintenance
17 May 24	-		Under Maintenance
18 May 24	859		In Operation
19 May 24	861		In Operation
20 May 24	867		In Operation
21 May 24	880		In Operation
22 May 24	868		In Operation
23 May 24	869		In Operation
24 May 24	-		Under Maintenance
25 May 24	-		Under Maintenance
26 May 24	-		Under Maintenance
27 May 24	882		In Operation
28 May 24	876		In Operation
29 May 24	875		In Operation
30 May 24	879		In Operation
31 May 24	881		In Operation
1 Jun 24	879		In Operation
2 Jun 24	882		In Operation
3 Jun 24	854		In Operation
4 Jun 24	859		In Operation
5 Jun 24	855		In Operation
6 Jun 24	857		In Operation
7 Jun 24	849		In Operation

Date	Exhaust temperature (K)	Exhaust gas velocity (ms^{-1}) [a]	Operation Status (Landfill Gas Generator in Operation)
8 Jun 24	850	10.2	In Operation
9 Jun 24	850		In Operation
10 Jun 24	859		In Operation
11 Jun 24	858		In Operation
12 Jun 24	884		In Operation
13 Jun 24	-		Under Maintenance
14 Jun 24	-		Under Maintenance
15 Jun 24	-		Under Maintenance
16 Jun 24	-		Under Maintenance
17 Jun 24	-		Under Maintenance
18 Jun 24	-		Under Maintenance
19 Jun 24	-		Under Maintenance
20 Jun 24	-		Under Maintenance
21 Jun 24	-		Under Maintenance
22 Jun 24	-		Under Maintenance
23 Jun 24	-		Under Maintenance
24 Jun 24	854		In Operation
25 Jun 24	849		In Operation
26 Jun 24	850		In Operation
27 Jun 24	847		In Operation
28 Jun 24	854		In Operation
29 Jun 24	846		In Operation
30 Jun 24	-		Under Maintenance
Average	863	10.0	
Min	846	9.7	
Max	892	10.2	
ENGB			
1 Apr 24	836		In Operation
2 Apr 24	836		In Operation
3 Apr 24	838		In Operation
4 Apr 24	839		In Operation
5 Apr 24	874		In Operation
6 Apr 24	877		In Operation
7 Apr 24	878		In Operation
8 Apr 24	876		In Operation

Date	Exhaust temperature (K)	Exhaust gas velocity (ms^{-1}) [a]	Operation Status (Landfill Gas Generator in Operation)
9 Apr 24	872	9.7	In Operation
10 Apr 24	875		In Operation
11 Apr 24	876		In Operation
12 Apr 24	877		In Operation
13 Apr 24	879		In Operation
14 Apr 24	881		In Operation
15 Apr 24	880		In Operation
16 Apr 24	846		In Operation
17 Apr 24	848		In Operation
18 Apr 24	847		In Operation
19 Apr 24	849		In Operation
20 Apr 24	847		In Operation
21 Apr 24	847		In Operation
22 Apr 24	849		In Operation
23 Apr 24	879		In Operation
24 Apr 24	880		In Operation
25 Apr 24	881		In Operation
26 Apr 24	-		Under Maintenance
27 Apr 24	-		Under Maintenance
28 Apr 24	-		Under Maintenance
29 Apr 24	840		In Operation
30 Apr 24	837		In Operation
1 May 24	870	10.0	In Operation
2 May 24	869		In Operation
3 May 24	870		In Operation
4 May 24	869		In Operation
5 May 24	871		In Operation
6 May 24	871		In Operation
7 May 24	870		In Operation
8 May 24	867		In Operation
9 May 24	864		In Operation
10 May 24	868		In Operation
11 May 24	847		In Operation
12 May 24	848		In Operation
13 May 24	869		In Operation

Date	Exhaust temperature (K)	Exhaust gas velocity (ms^{-1}) [a]	Operation Status (Landfill Gas Generator in Operation)
14 May 24	849		In Operation
15 May 24	862		In Operation
16 May 24	867		In Operation
17 May 24	868		In Operation
18 May 24	870		In Operation
19 May 24	-		Under Maintenance
20 May 24	-		Under Maintenance
21 May 24	-		Under Maintenance
22 May 24	-		Under Maintenance
23 May 24	869		In Operation
24 May 24	869		In Operation
25 May 24	870		In Operation
26 May 24	871		In Operation
27 May 24	873		In Operation
28 May 24	-		Under Maintenance
29 May 24	-		Under Maintenance
30 May 24	-		Under Maintenance
31 May 24	-		Under Maintenance
1 Jun 24	-		Under Maintenance
2 Jun 24	-		Under Maintenance
3 Jun 24	-		Under Maintenance
4 Jun 24	-		Under Maintenance
5 Jun 24	-		Under Maintenance
6 Jun 24	-		Under Maintenance
7 Jun 24	-		Under Maintenance
8 Jun 24	-		Under Maintenance
9 Jun 24	-		Under Maintenance
10 Jun 24	-		Under Maintenance
11 Jun 24	-		Under Maintenance
12 Jun 24	851		In Operation
13 Jun 24	851		In Operation
14 Jun 24	851		In Operation
15 Jun 24	847	10.2	In Operation
16 Jun 24	851		In Operation
17 Jun 24	857		In Operation

Date	Exhaust temperature (K)	Exhaust gas velocity (ms^{-1}) [a]	Operation Status (Landfill Gas Generator in Operation)
18 Jun 24	856		In Operation
19 Jun 24	850		In Operation
20 Jun 24	856		In Operation
21 Jun 24	856		In Operation
22 Jun 24	856		In Operation
23 Jun 24	857		In Operation
24 Jun 24	873		In Operation
25 Jun 24	871		In Operation
26 Jun 24	867		In Operation
27 Jun 24	874		In Operation
28 Jun 24	872		In Operation
29 Jun 24	872		In Operation
30 Jun 24	873		In Operation
Average	862	10.0	
Min	836	9.7	
Max	881	10.2	

Notes:

(a) The exhaust gas velocity was calculated based on the cross-section area of the stack and the gas flow and combustion temperature data measured during the stack emission monitoring.

ANNEX D6 AMBIENT VOCs, AMMONIA AND H2S MONITORING RESULTS

TABLE D6.1 AMBIENT VOCS, AMMONIA AND H_2S MONITORING RESULTS

Parameters	Limit Level	Monitoring Results (µg m^{-3})			
		AM1	AM2	AM3	AM4
Ammonia	180	35	48	53	49
H_2S	42	<15	<15	<15	<15
Methane	NA [(a)]	0.00018 %(v/v)	0.0003 %(v/v)	0.00019 %(v/v)	0.00019 %(v/v)
1.1.1-Trichloroethane	5,550	<0.8	<0.8	<0.8	<0.8
1.2-Dibromoethane (EDB)	39	<1.0	<1.0	<1.0	<1.0
1.2-Dichloroethane	210	0.3	0.3	0.4	0.3
Benzene	33	<0.5	<0.5	<0.5	<0.5
Butan-2-ol	667	<0.6	<0.6	<0.6	<0.6
Butanethiol	4	<1.2	<1.2	<1.2	<1.2
Carbon Disulphide	150	0.6	1.6	<0.5	0.5
Carbon Tetrachloride	64	<0.6	<0.6	<0.6	<0.6
Chloroform	99	<0.8	<0.8	<0.8	<0.8
Decanes	3,608	<0.7	<0.7	<0.7	<0.7
Dichlorobenzene	120	<1.0	<1.0	<1.0	<1.0
Dichlorodifluoro-methane	NA [(a)]	1.6	1.6	1.8	1.8
Dimethylsulphide	8	<0.2	<0.2	<0.2	<0.2
Dipropyl ether	NA [(a)]	<0.8	<0.8	<0.8	<0.8
Limonene	212	<0.4	<0.4	<0.4	<0.4
Ethanethiol	13	<0.6	<0.6	<0.6	<0.6
Ethanol	19,200	6.9	5.6	<3.8	10.7
Ethyl butanoate	71	<1.0	<1.0	<1.0	<1.0
Ethyl propionate	29	<0.8	<0.8	<0.8	<0.8
Ethyl benzene	738	<0.5	<0.5	<0.5	<0.5
Heptane	2,746	<0.8	<0.8	<0.8	<0.8

Parameters	Limit Level	Monitoring Results (μg m^{-3})			
		AM1	AM2	AM3	AM4
Methanethiol	10	<0.4	<0.4	<0.4	<0.4
Methanol	2,660	64.1	67.8	32.8	65.8
Methyl butanoate	30	<0.8	<0.8	<0.8	<0.8
Methyl propionate	353	<0.7	<0.7	<0.7	<0.7
Methylene Chloride	3,530	1.2	1.3	1.3	1.3
Butyl acetate	76	<1.0	<1.0	<1.0	<1.0
Butyl benzene	47	<1.0	<1.0	<1.0	<1.0
Nonane	11,540	<0.9	<0.9	<0.9	<0.9
Propyl benzene	19	<0.8	<0.8	<0.8	<0.8
Octane	7,942	<0.9	<0.9	<0.9	<0.9
Propyl propionate	276	<1.0	<1.0	<1.0	<1.0
Terpenes	NA [(a)]	<0.8	<0.8	<0.8	<0.8
Tetrachloroethylene	1,380	<0.7	<0.7	<0.7	<0.7
Toluene	1,244	<0.5	0.8	<0.5	<0.5
Trichloroethylene	5,500	<1.1	<1.1	<1.1	<1.1
Undecane	5,562	<1.2	<1.2	<1.2	<1.2
Vinyl Chloride	26	<0.3	<0.3	<0.3	<0.3
Xylenes	534	<0.5	0.5	<0.5	<0.5

Notes:

(a) No relevant WHO/USEPA/CARB's ambient criteria, odour thresholds and WEL available.

ANNEX D7 INVESTIGATION REPORTS OF ENVIRONMENTAL QUALITY LIMIT EXCEEDANCE

Investigation Report of Environmental Quality Limit Exceedance

Project	South East New Territories (SENT) Landfill Extension
Date	18 April 2024
Time	11:15 – 11:50
Monitoring Location	Landfill Gas Flare 1 (F601)
Parameter	Carbon Monoxide (CO), Benzene
Limit Levels	CO: >2.43 g/s Benzene: >0.000414 g/s
Measured Level	CO: 2.61 g/s Benzene: 0.006479 g/s
Possible reason	As confirmed by the Contractor, Landfill Gas Flare 1 (F601) was under normal operating conditions during the sampling event. However, it was shut down for a short period (around 5 minutes) due to adverse weather condition and thunderstorm warning signal during the sampling event. The landfill gas flare emission monitoring results (NO_2, SO_2, Vinyl chloride, gas combustion temperature, exhaust temperature and exhaust gas velocity) at Landfill Gas Flare 1 (F601) on 18 April 2024 were well within the respective limit levels. It is possible that the slight exceedances of CO and Benzene limit levels measured on 18 April 2024 could be due to some short-term system instability (e.g. insufficient air, short gas residence time or ineffective mixing of landfill gas and air during the combustion) and the accumulation of landfill gas without complete combustion due to temporary shutdown of Landfill Gas Flare 1 (F601) during the sampling event. Hence, the CO and Benzene exceedances at Landfill Gas Flare 1 (F601) on 18 April 2024 are considered Project related. In accordance with Table 3.8b of the updated EM&A Manual, repeat measurement was conducted on 9 May 2024 (it should be noted that the turnaround time of the laboratory analysis of the flue gas sample is 3 weeks and the results were available on 27 May 2024) to confirm findings. The CO concentration (0.02g/s) measured on 9 May 2024 is well below Limit Level. There is no consecutive exceedance of CO concentrations in the flue gas emission of Landfill Gas Flare 1 (F601). However, Benzene concentration of 0.000673 g/s was measured at Landfill Gas Flare 1 (F601) during the sampling event. Landfill Gas Flare 1 (F601) showed consecutive exceedance of the landfill gas flare stack emission limit (Benzene). It should be noted that although the measured CO and Benzene level exceeded the limit level of the EM&A programme (which was set based on the stack design parameters), the exceedances of CO

	and Benzene on 18 April 2024 will not cause adverse air quality impact to the identified ASRs as the anticipated CO and Benzene concentrations at the identified ASRs will still be well below the respective AQO criteria with reference to the findings of the operational air quality impact assessment of the SENTX Environmental Review Report.
Action Taken / Action to be Taken	Examination of environmental performance of the Project will be continued during the weekly inspections. The Contractor is reminded to closely monitoring the operating conditions of the flare to avoid any exceedance of the Limit Levels. ET will continue to closely monitor the landfill gas flare stack emission monitoring results and collect additional data for investigation and further review, if necessary.
Remarks	-

Prepared by: Abbey Lau
Designation: Environmental Team
Date: 27 May 2024

Investigation Report of Environmental Quality Limit Exceedance

Project	South East New Territories (SENT) Landfill Extension
Date	9 May 2024
Time	13:34 – 14:26
Monitoring Location	Landfill Gas Flare 1 (F601)
Parameter	Benzene
Limit Levels	>0.000414 g/s
Measured Level	0.000673 g/s
Possible reason	As confirmed by the Contractor, Landfill Gas Flare 1 (F601) was under normal operating conditions during the sampling event. The landfill gas flare emission monitoring results (NO_2, CO, SO_2, Vinyl chloride, gas combustion temperature, exhaust temperature and exhaust gas velocity) at Landfill Gas Flare 1 (F601) on 9 May 2024 were well within the respective limit levels. It is possible that the slight exceedances of Benzene limit level measured on 9 May 2024 could be due to some short-term system instability (e.g. insufficient air, short gas residence time or ineffective mixing of landfill gas and air during the combustion). Hence, the Benzene exceedance at Landfill Gas Flare 1 (F601) on 9 May 2024 is considered Project related. In accordance with Table 3.8b of the updated EM&A Manual, repeat measurement was conducted on 17 June 2024 (it should be noted that the turnaround time of the laboratory analysis of the flue gas sample is 3 weeks and the results were available on 8 July 2024) to confirm findings. The Benzene concentration (<0.000121g/s) measured on 17 June 2024 is well below Limit Level. There is no consecutive exceedance of Benzene concentrations in the flue gas emission of Landfill Gas Flare 1 (F601). It should be noted that although the measured Benzene level exceeded the limit level of the EM&A programme (which was set based on the stack design parameters), the exceedance of Benzene on 9 May 2024 will not cause adverse air quality impact to the identified ASRs as the anticipated Benzene concentrations at the identified ASRs will still be well below the respective AQO criteria with reference to the findings of the operational air quality impact assessment of the SENTX Environmental Review Report.
Action Taken / Action to be Taken	Examination of environmental performance of the Project will be continued during the weekly inspections. The Contractor is reminded to closely monitoring the operating conditions of the flare to avoid any exceedance of the Limit Levels.

	ET will continue to closely monitor the landfill gas flare stack emission monitoring results and collect additional data for investigation and further review, if necessary.
Remarks	-

Prepared by: Abbey Lau
Designation: Environmental Team
Date: 11 July 2024

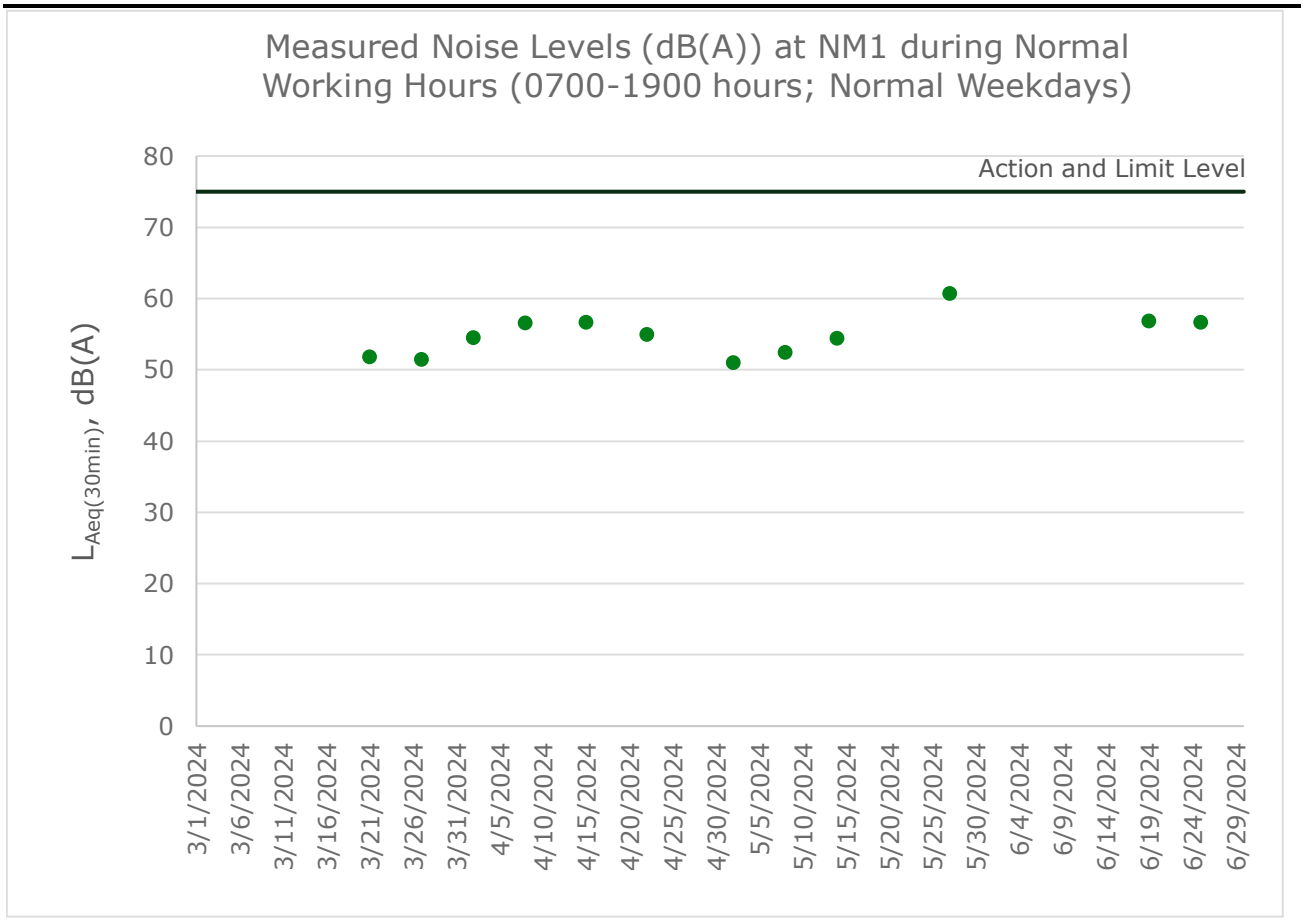
ANNEX E NOISE

ANNEX E1 NOISE MONITORING RESULTS

TABLE E1.1 MEASURED NOISE LEVELS (DB(A)) AT NM1 DURING NORMAL WORKING HOURS (0700-1900 HOURS; NORMAL WEEKDAYS)

Date	Start Time	Finish Time	Weather	$L_{10\ (30min)}$	$L_{90\ (30min)}$	$L_{eq\ (30min)}$
2 Apr 24	10:43	11:13	Sunny	56.8	51.4	54.6
8 Apr 24	10:39	11:09	Cloudy	59.3	52.1	56.6
15 Apr 24	10:49	11:19	Sunny	58.9	53.2	56.7
22 Apr 24	10:50	11:20	Cloudy	57.1	51.8	55.0
2 May 24	14:49	15:19	Cloudy	55.4	53.6	51.1
8 May 24	10:42	11:12	Sunny	54.8	49.5	52.5
14 May 24	9:44	10:14	Sunny	55.8	50.8	54.5
20 May 24	10:31	11:01	Rainy	Monitoring was cancelled due to adverse weather.		
27 May 24	10:53	11:23	Cloudy	62.1	54.3	60.8
3 Jun 24	14:35	15:05	Rainy	Monitoring was cancelled due to adverse weather.		
14 Jun 24	10:45	11:15	Rainy	Monitoring was cancelled due to adverse weather.		
19 Jun 24	13:31	14:01	Sunny	58.6	19 Jun 24	13:31
25 Jun 24	11:03	11:33	Sunny	58.9	25 Jun 24	11:03
					Average	55.5
					Min	51.1
					Max	60.8

FIGURE E1.1 GRAPHICAL PRESENTATION FOR NOISE MONITORING AT NM1



ANNEX E2 EVENT AND ACTION PLAN FOR NOISE MONITORING

ANNEX E2 EVENT AND ACTION PLAN FOR OPERATIONAL NOISE MONITORING

Action			
Event	**ET**	**IEC**	**Contractor**
Action Level	• Identify the source(s) and investigate the cause(s) of exceedance and complaint • Prepare Notification of Exceedance within 24 hours • Inform Contractor, IEC and Project Proponent whether the cause of exceedance is due to the Project • Discuss with Contractor and IEC for remedial measures required • Ensure remedial measures are properly implemented • Have additional monitoring if exceedance is due to the Project. If exceedance stops, cease additional monitoring	• Verify the Notification of Exceedance • Check monitoring data submitted by ET • Discuss with ET and Contractor on proposed remedial measures • Review proposals on remedial measures • Audit the implementation of the remedial measures • Audit the effectiveness of the implemented remedial measures	• Submit proposals for remedial measures to IEC • Implement the agreed proposals

Action			
Event	**ET**	**IEC**	**Contractor**
Limit Level	• Identify the source(s) and investigate the cause(s) of exceedance and complaint • Prepare Notification of Exceedance within 24 hours • Inform Contractor, IEC, Project Proponent and EPD whether the cause of exceedance is due to the Project • Analyse the operation of SENTX and investigate the causes of exceedance • Provide interim report to Contractor, IEC, Project Proponent and EPD the causes of the exceedances • Discuss with Contractor and IEC for remedial measures required • Ensure remedial measures are properly implemented • Report the remedial measures implemented and the additional monitoring results to Contactor, IEC, Project Proponent and EPD • Have additional monitoring if exceedance is due to the Project. If exceedance stops, cease additional monitoring	• Verify the Notification of Exceedance • Check monitoring data submitted by ET • Discuss with ET and Contractor on proposed remedial measures • Review proposals on remedial measures • Audit the implementation of the remedial measures • Audit the effectiveness of the implemented remedial measures	• Take immediate measures to avoid further exceedance • Submit proposals for remedial measures to IEC within 3 working days of notification • Implement the agreed proposals • Resubmit proposals if problem still not under control • Stop the relevant activity of works as determined by the Project Proponent until the exceedance is abated

ANNEX F WATER QUALITY

ANNEX F1 SURFACE WATER QUALITY MONITORING RESULTS

TABLE F1.1 SURFACE WATER QUALITY MONITORING RESULTS AT DP3

Date	Time	Weather Condition	Water Appearance	Water Condition	Water Temperature (°C)	Ammoniacal-nitrogen (mg/L)	COD	Suspended Solids (SS) (mg/L)	Remarks
12 Apr 2024	09:42	Sunny	Unable to collect water sample due to insufficient flow						
12 Jun 2024	09:15	Sunny	Unable to collect water sample due to insufficient flow						
					Average	-	-	-	-
					Min	-	-	-	-
					Max	-	-	-	-

TABLE F1.2 SURFACE WATER QUALITY MONITORING RESULTS AT DP4

Date	Time	Weather Condition	Water Appearance	Water Condition	Water Temperature (°C)	Ammoniacal-nitrogen (mg/L)	COD	Suspended Solids (SS) (mg/L)	Remarks
12 Apr 2024	09:46	Sunny	Unable to collect water sample due to insufficient flow						
6 May 2024	10:06	Sunny	Unable to collect water sample due to insufficient flow						
					Average	-	-	-	-
					Min	-	-	-	-
					Max	-	-	-	-

TABLE F1.3 SURFACE WATER QUALITY MONITORING RESULTS AT DP6

Date	Time	Weather Condition	Water Appearance	Water Condition	Water Temperature (°C)	Ammoniacal-nitrogen (mg/L)	COD	Suspended Solids (SS) (mg/L)	Remarks
12 Apr 2024	09:52	Sunny	Unable to collect water sample due to insufficient flow						
					Average	-	-	-	-
					Min	-	-	-	-
					Max	-	-	-	-

TABLE F1.4 SURFACE WATER MONITORING RESULTS

Date				6 May 24	6 May 24	6 May 24	30 May 24	30 May 24	30 May 24	12 Jun 24
		Limit Level (DP3)	Limit Level (DP4 & 6)	DP3	DP6	DP6 (Duplicate)	DP3	DP6	DP3 (Duplicate)	DP4
On-site Measurement										
pH Value	pH Unit	6 - 9	6 - 9	8.4	7.8	7.8	7.6	8.1	7.6	9.3
Electrical Conductivity	µS/cm	-	-	891	289	290	912	313	910	282
Dissolved Oxygen	mg/L	-	-	7.5	6.8	6.9	7.4	9.1	7.4	7
Volume Discharge	m^3	-	-	6340	- [(a)]	- [(a)]	2170	27	2170	1185
Laboratory Analysis										
Bicarbonate	mg/L	-	154	154	70	71	-	-	-	104
Carbonate	mg/L	-	6	6	<1	<1	-	-	-	24
Suspended Solids (SS)	mg/L	30	3.6	3.6	22	26.3	-	34.3	-	395
Ammonia-nitrogen	mg/L	0.5	1.38	1.38	0.02	0.02	0.18	-	0.16	0.12
Chloride	mg/L	-	73	73	26	25	-	-	-	28
Nitrite-nitrogen	mg/L	-	0.39	0.39	0.03	0.03	-	-	-	0.05
Phosphate	mg/L	5	0.04	0.04	0.01	<0.01	-	-	-	<0.01
Sulphate	mg/L	-	134	134	32	32	-	-	-	51
Sulphide	mg/L	2.5	<0.1	<0.1	<0.1	<0.1	-	-	-	<0.1

Total Kjeldahl Nitrogen(TKN)	mg/L	2.5	0.3	2.5	0.3	0.3	-	-	-	0.4
Nitrate-nitrogen	mg/L	2.42	0.67	2.42	0.67	0.66	-	-	-	0.52
Total Nitrogen(TN)	mg/L	5.3	1	5.3	1	1	-	-	-	0.9
Biochemical Oxygen Demand	mg/L	<2	<2	<2	<2	<2	-	-	-	<2
Chemical Oxygen Demand	mg/L	16	11	16	11	10	-	-	-	7
Oil & Grease	mg/L	<5	<5	<5	<5	<5	-	-	-	<5
Total Organic Carbon	mg/L	5	2	5	2	3	-	-	-	4
Boron	µg/L	1100	1100	160	40	40	-	-	-	60
Calcium	mg/L	-	-	90	29.6	30.6	-	-	-	29.6
Mercury	µg/L	1	1	<0.20	<0.20	<0.20	-	-	-	<0.20
Magnesium	mg/L	-	-	7.97	2.26	2.33	-	-	-	1.35
Sodium	mg/L	-	-	57	17.6	19.7	-	-	-	17.6
Iron	mg/L	3	3	<0.04	<0.04	<0.04	-	-	-	<0.04
Potassium	mg/L	-	-	12.7	6.93	7.21	-	-	-	5.8
Cadmium	µg/L	1	1	<0.2	<0.2	<0.2	-	-	-	<0.2
Chromium	µg/L	300	300	2	<1	<1	-	-	-	2
Copper	µg/L	300	300	2	<1	<1	-	-	-	1
Lead	µg/L	300	300	<1	<1	<1	-	-	-	<1
Manganese	µg/L	-	-	6	2	6	-	-	-	<1

Nickel	µg/L	300	300	<1	<1	<1	-	-	-	<1
Zinc	µg/L	-	-	<10	<10	213	-	-	-	<10

Note:
(a) The flow meter of DP6 is under maintenance.

Date				**12 Jun 24**	**12 Jun 24**	**12 Jun 24**
		Limit Level (DP3)	**Limit Level (DP4 & 6)**	**DP4**	**DP6**	**DP6 (Duplicate)**
On-site Measurement						
pH Value	pH Unit	6 - 9	6 - 9	9.3	7.9	7.9
Electrical Conductivity	µS/cm	-	-	282	278	277
Dissolved Oxygen	mg/L	-	-	7	8.3	8.3
Volume Discharge	m^3	-	-	1185	28	28
Laboratory Analysis						
Bicarbonate	mg/L	-	154	104	76	75
Carbonate	mg/L	-	6	24	<1	<1
Suspended Solids (SS)	mg/L	30	3.6	395	10.6	10.1
Ammonia-nitrogen	mg/L	0.5	1.38	0.12	<0.01	<0.01
Chloride	mg/L	-	73	28	25	25
Nitrite-nitrogen	mg/L	-	0.39	0.05	<0.01	<0.01
Phosphate	mg/L	5	0.04	<0.01	<0.01	<0.01
Sulphate	mg/L	-	134	51	18	18

Sulphide	mg/L	2.5	<0.1	<0.1	<0.1	<0.1
Total Kjeldahl Nitrogen(TKN)	mg/L	2.5	0.3	0.4	<0.1	<0.1
Nitrate-nitrogen	mg/L	2.42	0.67	0.52	0.26	0.26
Total Nitrogen(TN)	mg/L	5.3	1	0.9	0.3	0.3
Biochemical Oxygen Demand	mg/L	<2	<2	<2	<2	<2
Chemical Oxygen Demand	mg/L	16	11	7	3	3
Oil & Grease	mg/L	<5	<5	<5	<5	<5
Total Organic Carbon	mg/L	5	2	4	2	2
Boron	µg/L	1100	1100	60	50	50
Calcium	mg/L	-	-	29.6	30	29.9
Mercury	µg/L	1	1	<0.20	<0.20	<0.20
Magnesium	mg/L	-	-	1.35	1.49	1.49
Sodium	mg/L	-	-	17.6	17	17
Iron	mg/L	3	3	<0.04	<0.04	<0.04
Potassium	mg/L	-	-	5.8	6.34	6.27
Cadmium	µg/L	1	1	<0.2	<0.2	<0.2
Chromium	µg/L	300	300	2	<1	<1
Copper	µg/L	300	300	1	<1	<1
Lead	µg/L	300	300	<1	<1	<1
Manganese	µg/L	-	-	<1	5	4

Nickel	µg/L	300	300	<1	<1	<1
Zinc	µg/L	-	-	<10	<10	<10

ANNEX F2 EVENT AND ACTION PLAN FOR WATER QUALITY MONITORING

ANNEX F2 EVENT AND ACTION PLAN FOR WATER QUALITY MONITORING DURING OPERATION/ RESTORATION PHASE

Action			
Event	**ET**	**IEC**	**Contractor**
Exceedance of Limit Level for surface water monitoring	• Identify source(s) of impact and investigate the cause(s) of exceedance • Prepare Notification of Exceedance within 24 hours • Inform Contractor, IEC, Project Proponent and EPD (EIAO Authority) whether the cause of exceedance is due to the Project • Discuss with Contractor and IEC for remedial measures required • Ensure remedial measures are properly implemented • Repeat measurement to confirm finding if exceedance is due to the Project • Increase monitoring frequency to weekly if exceedance is due to the Project until no exceedance of Limit Level	• Verify the Notification of Exceedance • Check monitoring data submitted by ET • Check Contractor's working methods • Discuss with ET and Contractor on proposed remedial measures • Review proposals on remedial measures • Audit the implementation of the remedial measures • Audit the effectiveness of the implemented remedial measures	• Take immediate action to avoid further exceedance • Submit proposals for remedial measures to IEC • Implement the agreed proposals • Amend proposal if appropriate
Exceedance of Limit Level for groundwater monitoring	• Identify source(s) of impact and investigate the cause(s) of exceedance • Prepare Notification of Exceedance within 24 hours • Inform Contractor, IEC, Project Proponent and EPD (EIAO Authority) whether the cause of exceedance is due to the Project • Discuss with Contractor and IEC for remedial measures required • Ensure remedial measures are properly implemented	• Verify the Notification of Exceedance • Check monitoring data submitted by ET • Check Contractor's working methods • Discuss with ET and Contractor on proposed remedial measures • Review proposals on remedial measures • Audit the implementation of the remedial measures • Audit the effectiveness of the implemented remedial measures	• Divert groundwater collected at the collection sumps to the leachate treatment plant • Submit proposals for remedial measures to IEC • Rectify any unacceptable practice or design • Amend working methods as required • Implement amended working methods, if necessary

Action			
Event	**ET**	**IEC**	**Contractor**
	• Repeat measurement to confirm finding if exceedance is due to the Project • Increase monitoring frequency to weekly if exceedance is due to the Project until no exceedance of Limit Level		
Exceedance of Limit Level for leachate level	• Investigate the cause(s) of exceedance • Prepare Notification of Exceedance within 24 hours • Inform Contractor, IEC, Project Proponent and EPD (EIAO Authority) whether the cause of exceedance is due to the Project • Discuss with Contractor and IEC for remedial measures required • Ensure remedial measures are properly implemented	• Verify the Notification of Exceedance • Check with Contractor on the operating activities and performance of the leachate collection system • Discuss with ET and Contractor on proposed remedial measures • Review proposals on remedial measures • Audit the implementation of the remedial measures • Audit the effectiveness of the implemented remedial measures	• Check the performance of the leachate collection system • Rectify any unacceptable practice; • Amend leachate collection design if required • Implement amended leachate collection system, if necessary
Exceedance of Limit Level of effluent discharge from LTP	• Investigate the cause(s) of exceedance • Prepare Notification of Exceedance within 24 hours • Inform Contractor, IEC, Project Proponent and EPD (EIAO Authority) whether the cause of exceedance is due to the Project • Discuss with Contractor and IEC for remedial measures required • Ensure remedial measures are properly implemented • Repeat measurement to confirm finding if exceedance is due to the Project	• Verify the Notification of Exceedance • Check with Contractor on the operation performance of the LTP • Discuss with ET and Contractor on proposed remedial measures • Review proposals on remedial measures • Audit the implementation of the remedial measures • Audit the effectiveness of the implemented • remedial measures	• Rectify any unacceptable practice; • Carry out remedial measures or amend design as required • Implement amended design, if necessary

Action			
Event	**ET**	**IEC**	**Contractor**
	• Increase monitoring frequency to weekly until no exceedance of Limit Level		

ANNEX F3 LEACHATE LEVELS MONITORING RESULTS

TABLE F3.1 LEACHATE LEVEL MONITORING RESULTS (PUMP STATION NO.1X (CELL 1X))

Date	Meter No.X1 (cm)	Meter No.X2 (cm)	Average (cm)
Pump Station No. 1X (Cell 1X)			
1 Apr 24	106	119	113
2 Apr 24	106	119	113
3 Apr 24	106	119	113
4 Apr 24	106	119	113
5 Apr 24	106	119	113
6 Apr 24	106	119	113
7 Apr 24	106	119	113
8 Apr 24	104	119	112
9 Apr 24	108	124	116
10 Apr 24	111	126	119
11 Apr 24	113	128	121
12 Apr 24	115	128	122
13 Apr 24	115	131	123
14 Apr 24	117	131	124
15 Apr 24	117	131	124
16 Apr 24	117	111	114
17 Apr 24	117	115	116
18 Apr 24	119	133	126
19 Apr 24	119	135	127
20 Apr 24	104	119	112
21 Apr 24	111	124	118
22 Apr 24	119	133	126
23 Apr 24	108	124	116
24 Apr 24	119	135	127
25 Apr 24	111	126	119
26 Apr 24	117	135	126
27 Apr 24	102	119	111
28 Apr 24	102	119	111
29 Apr 24	102	119	111
30 Apr 24	102	119	111
1 May 24	102	119	111
2 May 24	102	119	111
3 May 24	102	119	111
4 May 24	128	117	123
5 May 24	117	118	118

Date	Meter No.X1 (cm)	Meter No.X2 (cm)	Average (cm)
6 May 24	106	119	113
7 May 24	102	119	111
8 May 24	102	119	111
9 May 24	102	119	111
10 May 24	102	115	109
11 May 24	102	117	110
12 May 24	102	117	110
13 May 24	102	117	110
14 May 24	102	119	111
15 May 24	102	119	111
16 May 24	102	119	111
17 May 24	102	119	111
18 May 24	102	119	111
19 May 24	104	119	112
20 May 24	102	106	104
21 May 24	104	111	108
22 May 24	104	106	105
23 May 24	102	117	110
24 May 24	102	111	107
25 May 24	104	93	99
26 May 24	103	106	105
27 May 24	102	119	111
28 May 24	102	119	111
29 May 24	102	99	101
30 May 24	102	117	110
1 Jun 24	102	93	98
2 Jun 24	102	99	101
3 Jun 24	102	119	111
4 Jun 24	104	106	105
5 Jun 24	102	117	110
6 Jun 24	102	97	100
7 Jun 24	70	88	79
8 Jun 24	102	119	111
9 Jun 24	102	119	111
10 Jun 24	102	119	111
11 Jun 24	102	111	107
12 Jun 24	102	119	111

Date	Meter No.X1 (cm)	Meter No.X2 (cm)	Average (cm)
13 Jun 24	102	111	107
14 Jun 24	102	119	111
15 Jun 24	102	106	104
16 Jun 24	104	113	109
17 Jun 24	102	113	108
18 Jun 24	102	117	110
19 Jun 24	102	111	107
20 Jun 24	102	111	107
21 Jun 24	102	113	108
22 Jun 24	102	95	99
23 Jun 24	102	105	104
24 Jun 24	102	115	109
25 Jun 24	102	99	101
26 Jun 24	102	111	107
27 Jun 24	102	115	109
28 Jun 24	102	119	111
29 Jun 24	102	113	108
30 Jun 24	102	111	107
Average	105	116	111
Min	70	88	79
Max	128	135	127

TABLE F3.2 LEACHATE LEVEL MONITORING RESULTS (PUMP STATION NO.2X (CELL 2X))

Date	Meter No.X3 (cm)	Meter No.X4 (cm)	Average (cm)
Pump Station No. 2X (Cell 2X)			
1 Apr 24	102	119	111
2 Apr 24	102	119	111
3 Apr 24	102	119	111
4 Apr 24	102	119	111
5 Apr 24	102	119	111
6 Apr 24	102	119	111
7 Apr 24	102	119	111
8 Apr 24	102	119	111
9 Apr 24	102	122	112
10 Apr 24	104	124	114
11 Apr 24	104	124	114
12 Apr 24	106	124	115
13 Apr 24	106	126	116
14 Apr 24	106	126	116
15 Apr 24	109	126	118
16 Apr 24	109	128	119
17 Apr 24	109	126	118
18 Apr 24	111	128	120
19 Apr 24	111	128	120
20 Apr 24	111	131	121
21 Apr 24	111	131	121
22 Apr 24	113	131	122
23 Apr 24	113	133	123
24 Apr 24	115	133	124
25 Apr 24	117	135	126
26 Apr 24	117	137	127
27 Apr 24	102	93	98
28 Apr 24	102	119	111
29 Apr 24	102	119	111
30 Apr 24	102	119	111
1 May 24	102	119	111
2 May 24	102	119	111
3 May 24	102	119	111
4 May 24	102	119	111
5 May 24	102	119	111

Date	Meter No.X3 (cm)	Meter No.X4 (cm)	Average (cm)
6 May 24	102	119	111
7 May 24	102	119	111
8 May 24	102	119	111
9 May 24	102	119	111
10 May 24	104	113	109
11 May 24	104	122	113
12 May 24	104	122	113
13 May 24	104	122	113
14 May 24	102	119	111
15 May 24	104	124	114
16 May 24	106	126	116
17 May 24	109	128	119
18 May 24	111	97	104
19 May 24	102	119	111
20 May 24	102	122	112
21 May 24	106	99	103
22 May 24	102	119	111
23 May 24	102	114	108
24 May 24	106	124	115
25 May 24	109	128	119
26 May 24	111	123	117
27 May 24	113	117	115
28 May 24	115	135	125
29 May 24	120	137	129
30 May 24	120	139	130
1 Jun 24	120	139	130
2 Jun 24	120	139	130
3 Jun 24	117	135	126
4 Jun 24	120	97	109
5 Jun 24	106	119	113
6 Jun 24	106	119	113
7 Jun 24	115	95	105
8 Jun 24	113	119	116
9 Jun 24	115	119	117
10 Jun 24	117	119	118
11 Jun 24	117	119	118
12 Jun 24	128	119	124

Date	Meter No.X3 (cm)	Meter No.X4 (cm)	Average (cm)
13 Jun 24	126	126	126
14 Jun 24	106	119	113
15 Jun 24	106	119	113
16 Jun 24	106	119	113
17 Jun 24	106	119	113
18 Jun 24	106	93	100
19 Jun 24	106	119	113
20 Jun 24	106	119	113
21 Jun 24	106	119	113
22 Jun 24	106	119	113
23 Jun 24	106	119	113
24 Jun 24	106	119	113
25 Jun 24	106	119	113
26 Jun 24	106	119	113
27 Jun 24	106	119	113
28 Jun 24	106	119	113
29 Jun 24	93	119	106
30 Jun 24	104	119	112
Average	108	121	115
Min	93	93	98
Max	128	139	130

TABLE F3.3 LEACHATE LEVEL MONITORING RESULTS (PUMP STATION NO.3X (CELL 3X))

Date	Meter No.X5 (cm)	Meter No.X6 (cm)	Average (cm)
Pump Station No. 3X (Cell 3X)			
1 Apr 24	113	113	113
2 Apr 24	115	115	115
3 Apr 24	115	115	115
4 Apr 24	117	117	117
5 Apr 24	119	119	119
6 Apr 24	119	119	119
7 Apr 24	102	102	102
8 Apr 24	104	104	104
9 Apr 24	106	106	106
10 Apr 24	111	108	110
11 Apr 24	111	111	111
12 Apr 24	113	111	112
13 Apr 24	113	113	113
14 Apr 24	115	115	115
15 Apr 24	115	115	115
16 Apr 24	117	117	117
17 Apr 24	117	117	117
18 Apr 24	119	119	119
19 Apr 24	102	102	102
20 Apr 24	104	104	104
21 Apr 24	106	106	106
22 Apr 24	111	111	111
23 Apr 24	117	115	116
24 Apr 24	106	106	106
25 Apr 24	113	113	113
26 Apr 24	117	117	117
27 Apr 24	104	104	104
28 Apr 24	111	111	111
29 Apr 24	115	115	115
30 Apr 24	117	117	117
1 May 24	114	114	114
2 May 24	111	111	111
3 May 24	117	117	117
4 May 24	115	111	113
5 May 24	115	113	114

Date	Meter No.X5 (cm)	Meter No.X6 (cm)	Average (cm)
6 May 24	115	115	115
7 May 24	102	102	102
8 May 24	113	113	113
9 May 24	119	119	119
10 May 24	104	104	104
11 May 24	111	111	111
12 May 24	115	115	115
13 May 24	119	119	119
14 May 24	102	102	102
15 May 24	108	108	108
16 May 24	113	113	113
17 May 24	115	115	115
18 May 24	117	117	117
19 May 24	119	119	119
20 May 24	106	106	106
21 May 24	113	113	113
22 May 24	104	104	104
23 May 24	111	111	111
24 May 24	117	117	117
25 May 24	113	113	113
26 May 24	112	112	112
27 May 24	111	111	111
28 May 24	99	99	99
30 May 24	119	119	119
31 May 24	108	108	108
1 Jun 24	115	115	115
2 Jun 24	108	108	108
3 Jun 24	119	119	119
4 Jun 24	113	113	113
5 Jun 24	106	106	106
6 Jun 24	117	117	117
7 Jun 24	108	108	108
8 Jun 24	117	117	117
9 Jun 24	107	108	108
10 Jun 24	97	99	98
11 Jun 24	115	115	115
12 Jun 24	106	106	106

Date	Meter No.X5 (cm)	Meter No.X6 (cm)	Average (cm)
13 Jun 24	117	117	117
14 Jun 24	106	106	106
15 Jun 24	117	117	117
16 Jun 24	106	106	106
17 Jun 24	117	117	117
18 Jun 24	106	106	106
19 Jun 24	115	115	115
20 Jun 24	102	102	102
21 Jun 24	113	113	113
22 Jun 24	111	106	109
23 Jun 24	113	112	113
24 Jun 24	115	117	116
25 Jun 24	97	97	97
26 Jun 24	108	108	108
27 Jun 24	115	115	115
28 Jun 24	119	119	119
29 Jun 24	104	104	104
30 Jun 24	111	111	111
Average	112	111	111
Min	97	97	97
Max	119	119	119

TABLE F3.4 LEACHATE LEVEL MONITORING RESULTS (PUMP STATION NO.4X (CELL 4X))

Date	Meter No.X7 (cm)	Meter No.X8 (cm)	Average (cm)
Pump Station No. 4X (Cell 4X)			
1 Apr 24	120	118	119
2 Apr 24	100	98	99
3 Apr 24	105	105	105
4 Apr 24	109	109	109
5 Apr 24	114	111	113
6 Apr 24	116	116	116
7 Apr 24	103	103	103
8 Apr 24	109	107	108
9 Apr 24	111	111	111
10 Apr 24	116	116	116
11 Apr 24	118	118	118
12 Apr 24	120	120	120
13 Apr 24	103	100	102
14 Apr 24	107	105	106
15 Apr 24	111	109	110
16 Apr 24	114	114	114
17 Apr 24	116	116	116
18 Apr 24	120	118	119
19 Apr 24	122	120	121
20 Apr 24	103	103	103
21 Apr 24	109	109	109
22 Apr 24	116	114	115
23 Apr 24	120	118	119
24 Apr 24	114	107	111
25 Apr 24	111	111	111
26 Apr 24	120	120	120
27 Apr 24	114	114	114
28 Apr 24	109	113	111
29 Apr 24	111	111	111
30 Apr 24	120	118	119
1 May 24	121	119	120
2 May 24	122	120	121
3 May 24	116	114	115
4 May 24	142	133	138

Date	Meter No.X7 (cm)	Meter No.X8 (cm)	Average (cm)
5 May 24	130	126	128
6 May 24	118	118	118
7 May 24	118	116	117
8 May 24	100	100	100
9 May 24	109	109	109
10 May 24	117	109	113
11 May 24	107	105	106
12 May 24	112	110	111
13 May 24	116	114	115
14 May 24	103	103	103
15 May 24	114	116	115
16 May 24	122	120	121
17 May 24	109	109	109
18 May 24	116	116	116
19 May 24	120	120	120
20 May 24	109	109	109
21 May 24	118	118	118
22 May 24	105	105	105
23 May 24	116	116	116
24 May 24	103	100	102
25 May 24	120	120	120
26 May 24	119	119	119
27 May 24	118	118	118
28 May 24	120	120	120
29 May 24	118	109	114
30 May 24	103	100	102
31 May 24	109	109	109
1 Jun 24	111	111	111
2 Jun 24	116	116	116
3 Jun 24	118	118	118
4 Jun 24	118	111	115
5 Jun 24	111	111	111
6 Jun 24	100	103	102
7 Jun 24	120	111	116
8 Jun 24	111	111	111
9 Jun 24	115	115	115
10 Jun 24	120	120	120

Date	Meter No.X7 (cm)	Meter No.X8 (cm)	Average (cm)
11 Jun 24	118	118	118
12 Jun 24	114	114	114
13 Jun 24	109	109	109
14 Jun 24	114	105	110
15 Jun 24	114	114	114
16 Jun 24	100	100	100
17 Jun 24	116	116	116
18 Jun 24	107	96	102
19 Jun 24	114	114	114
20 Jun 24	120	111	116
21 Jun 24	111	109	110
22 Jun 24	116	116	116
23 Jun 24	116	112	114
24 Jun 24	116	107	112
25 Jun 24	103	103	103
26 Jun 24	105	107	106
27 Jun 24	105	107	106
28 Jun 24	105	105	105
29 Jun 24	109	103	106
30 Jun 24	100	100	100
Average	113	112	113
Min	100	96	99
Max	142	133	138

FIGURE F3.1 GRAPHICAL PRESENTATION FOR LEACHATE LEVEL MONITORING RESULTS (PUMP STATION NO.1X (CELL 1X))

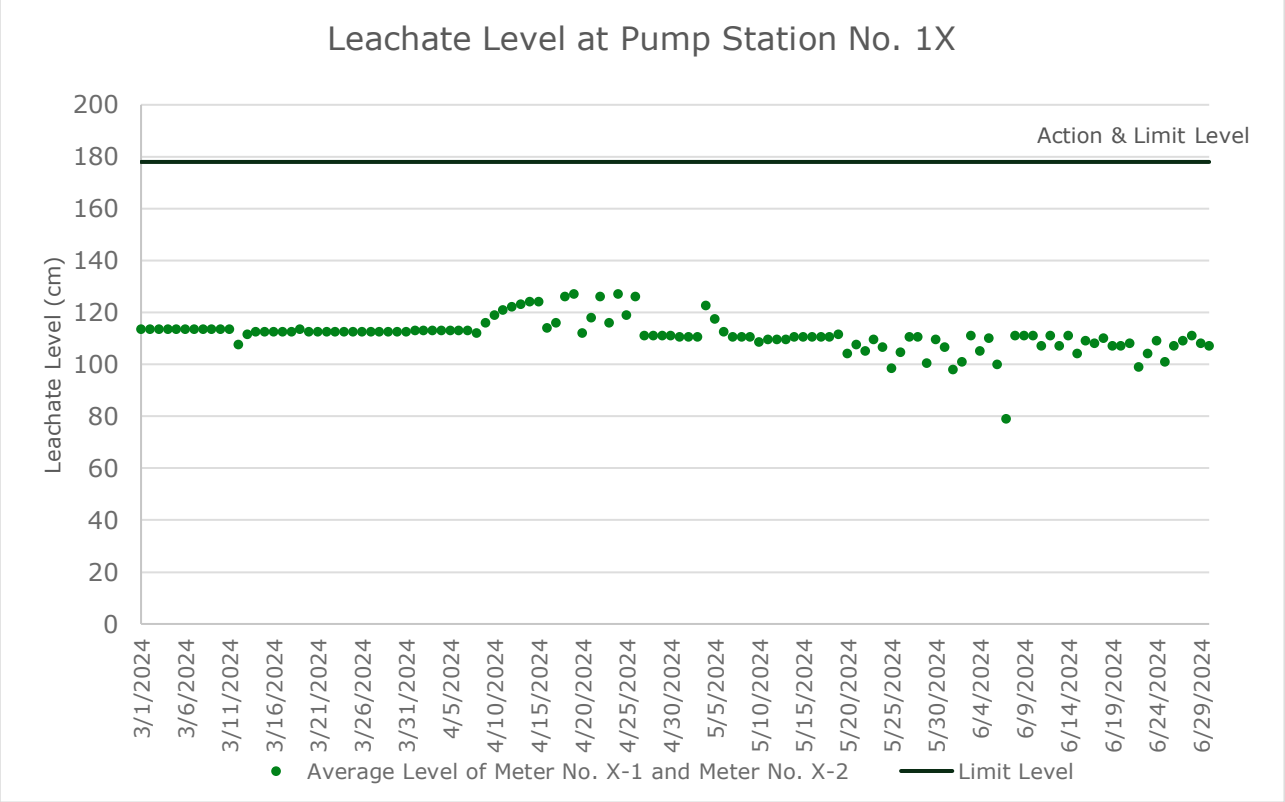


FIGURE F3.2 GRAPHICAL PRESENTATION FOR LEACHATE LEVEL MONITORING RESULTS (PUMP STATION NO.2X (CELL 2X))

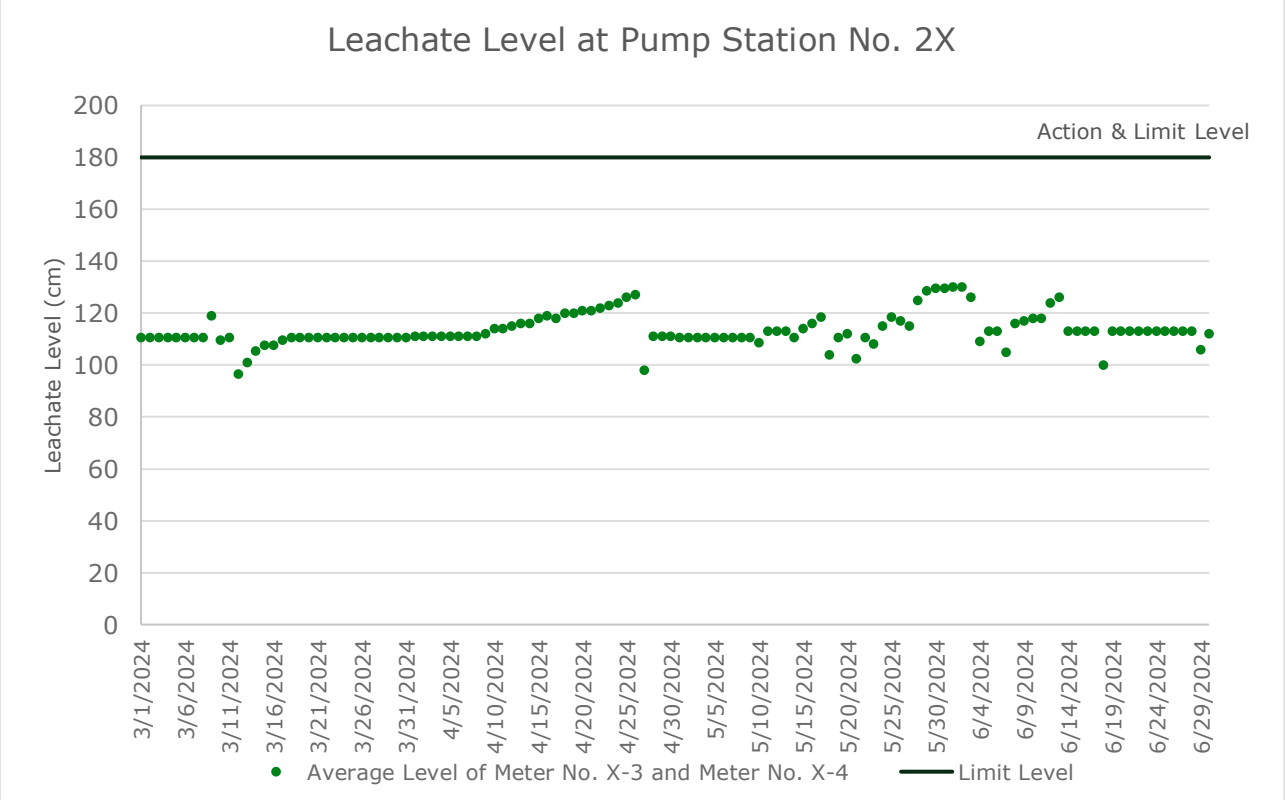


FIGURE F3.3 GRAPHICAL PRESENTATION FOR LEACHATE LEVEL MONITORING RESULTS (PUMP STATION NO.3X (CELL 3X))

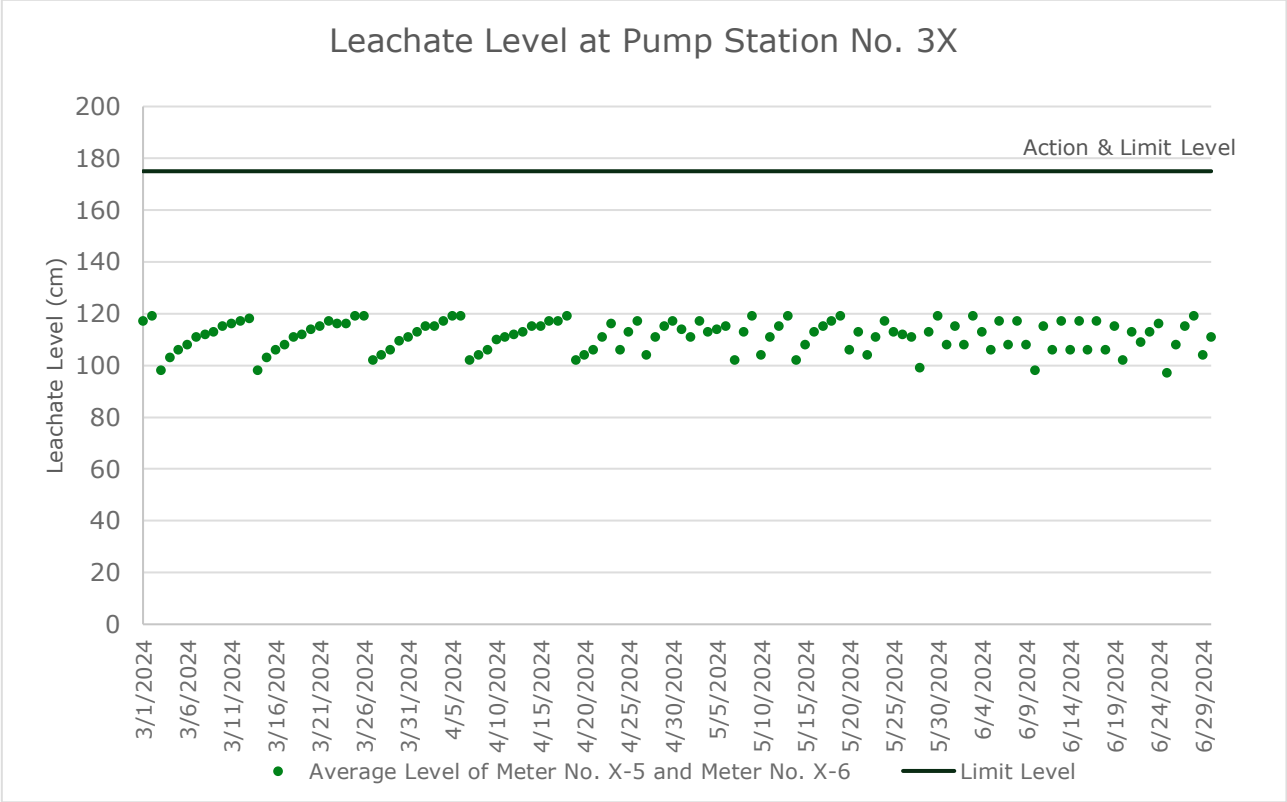
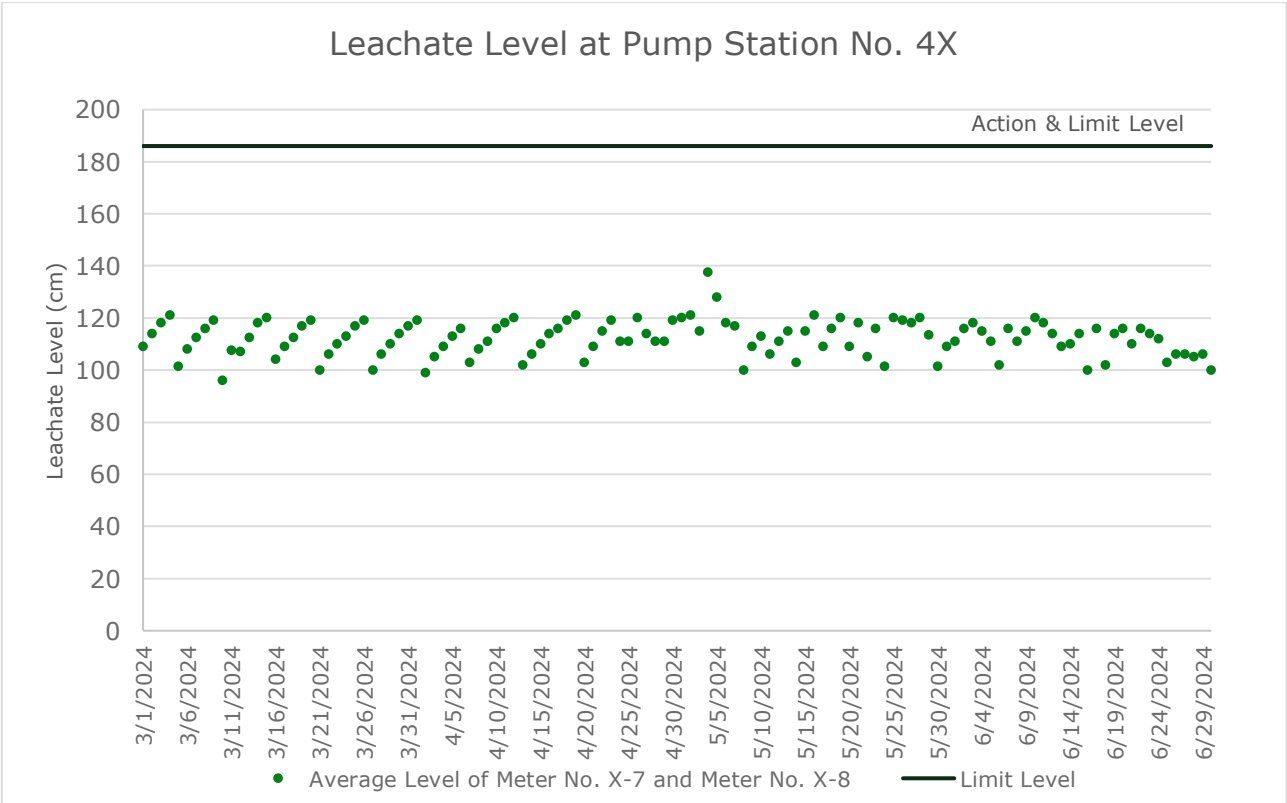


FIGURE F3.4 GRAPHICAL PRESENTATION FOR LEACHATE LEVEL MONITORING RESULTS (PUMP STATION NO.4X (CELL 4X))



ANNEX F4 EFFLUENT QUALITY MONITORING RESULTS

TABLE F4.1 EFFLUENT MONITORING RESULTS

Date		11 Apr 24	9 May 24	13 Jun 24
On-site Measurements				
Temperature	°C	33.1	34.3	31.6
pH Value	pH Unit	8.4	8.3	8.2
Volume Discharged	m^3	934	1,365	358
Laboratory Analysis				
Suspended Solids (SS)	mg/L	36.8	23	56.8
Alkalinity	mg/L	2400	1120	2070
Ammoniacal-nitrogen	mg/L	<0.01	0.25	23.4
Chloride	mg/L	2130	1520	1680
Nitrite-nitrogen	mg/L	0.27	0.11	0.87
Phosphate	mg/L	7.8	5.22	7.03
Sulphate	mg/L	169	224	135
Total Nitrogen	mg/L	99.5	74.6	105
Nitrate-nitrogen	mg/L	36.4	35.7	28.9
Total Inorganic Nitrogen	mg/L	36.67	36.06	53.17
Biochemical Oxygen Demand (BOD)	mg/L	10	10	32
Chemical Oxygen Demand (COD)	mg/L	1130	791	942
Oil & Grease	mg/L	<5	<5	<5
Total Organic Carbon (TOC)	mg/L	276	251	297
Boron	µg/L	5960	3820	4960
Calcium	mg/L	18.2	17.7	23.5
Iron	mg/L	2.44	1.26	2.06
Magnesium	mg/L	35.2	27.4	30.2
Potassium	mg/L	778	592	748
Cadmium	µg/L	<1.0	<1.0	<1.0
Chromium	µg/L	140	85	109
Copper	µg/L	<10	<10	<10
Nickel	µg/L	129	85	110
Zinc	µg/L	48	63	79

ANNEX F5 GROUNDWATER MONITORING RESULTS

TABLE F5.1 GROUNDWATER MONITORING RESULTS (APRIL 2024)

Parameters	Units	MWX-1	MWX-2	MWX-3	MWX-4	MWX-5	MWX-6	MWX-7	MWX-8	MWX-9	MWX-10	MWX-11	MWX-12	MWX-13	MWX-14
Water Level	mPD	2.73	2.79	2.68	2.55	2.65	2.48	2.38	3.14	2.8	2.58	3.07	11.86	34.96	41.17
Bicarbonate Alkalinity as CaCO3	mg/L	166	266	149	<1	2	<1	80	<1	165	201	162	57	15	12
Carbonate Alkalinity as CaCO3	mg/L	<1	<1	<1	63	31	122	12	81	<1	<1	<1	<1	<1	<1
Total Alkalinity as CaCO3	mg/L	166	266	149	76	33	175	91	119	165	201	162	57	15	12
pH Value	pH Unit	7.6	8	8	10.4	9.8	11.2	8.7	10.7	7.9	7.8	7.9	7	5.7	5.7
Electrical Conductivity	µS/cm	1520	934	1080	1010	3080	1210	2140	3660	2480	1130	1510	286	91	99
Ammonia	mg/L	0.49	0.02	1.44	5.3	2.69	4.86	5.38	15.7	0.54	0.02	0.08	0.03	0.02	0.03
Chloride	mg/L	336	42	216	241	828	226	591	1210	633	187	340	20	14	18
Nitrite	mg/L	<0.01	<0.01	<0.01	<0.01	<0.01	0.02	<0.01	0.02	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Phosphorus	mg/L	<0.01	0.01	<0.01	<0.01	<0.01	<0.01	0.02	<0.01	0.02	0.02	0.01	0.04	0.01	<0.01
Sulphate	mg/L	75	173	65	67	186	70	50	35	150	80	80	51	3	4
Sulphide	mg/L	<0.1	<0.1	<0.1	3.3	3.9	13.8	1.3	11	0.2	<0.1	<0.1	<0.1	<0.1	<0.1
Total Kjeldahl Nitrogen	mg/L	0.8	0.5	1.7	6.6	3.4	6.6	6.1	16.6	0.9	0.1	0.2	<0.1	0.2	0.3
Nitrate	mg/L	0.15	2.94	0.01	<0.01	0.02	<0.01	<0.01	<0.01	0.02	<0.01	0.02	<0.01	0.09	0.07
Total Nitrogen	mg/L	0.9	3.4	1.7	6.6	3.4	6.6	6.1	16.6	0.9	0.1	0.2	<0.1	0.3	0.4
Boron	µg/L	230	240	220	180	240	180	680	510	610	170	120	20	20	10
Calcium	mg/L	62.8	65	61.3	40.3	82.4	38.1	25	93.2	94.9	81.1	107	24.5	0.74	1.08

Parameters	Units	MWX-1	MWX-2	MWX-3	MWX-4	MWX-5	MWX-6	MWX-7	MWX-8	MWX-9	MWX-10	MWX-11	MWX-12	MWX-13	MWX-14
Mercury	µg/L	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Magnesium	mg/L	14.5	50.4	4.95	0.06	4.95	<0.05	10.6	<0.05	18.9	10.9	9.83	4.3	1.05	0.97
Sodium	mg/L	178	53.6	110	130	441	140	335	603	341	122	152	25.8	14.2	14.6
Iron	mg/L	<0.04	<0.04	0.1	<0.04	<0.04	<0.04	<0.04	<0.04	0.06	<0.04	<0.04	0.35	<0.04	<0.04
Potassium	mg/L	22.8	13.5	25.8	32.9	76.3	52.6	43	65.4	40.3	12	10.7	2.99	4.07	3.9
Cadmium	µg/L	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Chromium	µg/L	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Copper	µg/L	<1	<1	<1	<1	<1	<1	<1	<1	<1	2	<1	<1	4	2
Lead	µg/L	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Manganese	µg/L	2100	208	859	1	<1	<1	4	<1	264	2920	861	639	17	7
Nickel	µg/L	<1	<1	<1	1	<1	2	<1	<1	<1	<1	<1	<1	<1	<1
Zinc	µg/L	11	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	12	23	13
Biochemical Oxygen Demand	mg/L	<2	<2	<2	<2	<2	7	<2	6	<2	<2	<2	<2	<2	<2
Chemical Oxygen Demand	mg/L	7	6	18	26	28	47	15	46	18	3	4	3	3	2
Total Organic Carbon	mg/L	2	<1	6	6	<1	7	2	6	6	<1	<1	<1	<1	<1

TABLE F5.2 GROUNDWATER MONITORING RESULTS (MAY 2024)

Parameters	Units	MWX-1	MWX-2	MWX-3	MWX-4	MWX-5	MWX-6	MWX-7	MWX-8	MWX-9	MWX-10	MWX-11	MWX-12	MWX-13	MWX-14
Water Level	mPD	2.97	2.97	2.92	3.13	2.42	2.69	2.58	2.82	3.61	3.26	3.5	6.8	36.9	N/A [(a)]
Bicarbonate Alkalinity as CaCO3	mg/L	168	208	233	186	<1	<1	84	<1	157	207	232	58	14	N/A
Carbonate Alkalinity as CaCO3	mg/L	<1	<1	<1	<1	53	117	10	73	<1	<1	<1	<1	<1	N/A
Total Alkalinity as CaCO3	mg/L	168	208	233	186	79	184	94	112	157	207	232	58	14	N/A
pH Value	pH Unit	7.6	7.9	7.7	8	10.5	11.3	8.6	10.7	7.9	7.7	8	6.7	5.6	N/A
Electrical Conductivity	µS/cm	1540	4820	780	899	1740	1270	2160	3650	1120	1110	697	302	93	N/A
Ammonia	mg/L	0.29	1.05	0.05	0.09	6.59	3.92	4.66	14.5	0.02	0.01	0.03	0.04	0.03	N/A
Chloride	mg/L	346	1380	56	96	428	198	618	1070	145	150	45	20	14	N/A
Nitrite	mg/L	<0.01	<0.01	0.02	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.02	<0.01	<0.01	N/A
Phosphorus	mg/L	<0.01	0.01	0.02	<0.01	<0.01	<0.01	0.03	<0.01	0.02	0.02	<0.01	0.02	0.01	N/A
Sulphate	mg/L	75	262	84	129	129	89	45	40	224	117	67	60	3	N/A
Sulphide	mg/L	<0.1	<0.1	<0.1	<0.1	5.5	7.3	1.6	10.9	<0.1	<0.1	<0.1	<0.1	<0.1	N/A
Total Kjeldahl Nitrogen	mg/L	0.4	1	0.3	0.4	9.3	4.4	5.9	15.4	0.4	0.2	0.2	0.1	0.1	N/A
Nitrate	mg/L	0.01	0.17	0.32	0.04	<0.01	<0.01	<0.01	<0.01	0.01	<0.01	0.24	0.04	0.12	N/A
Total Nitrogen	mg/L	220	700	160	170	220	160	690	500	260	280	100	0.2	0.2	N/A
Boron	µg/L	68.9	84.1	92.8	98.6	35.1	38.1	22.9	88	113	90.9	88.6	20	10	N/A

Parameters	Units	MWX-1	MWX-2	MWX-3	MWX-4	MWX-5	MWX-6	MWX-7	MWX-8	MWX-9	MWX-10	MWX-11	MWX-12	MWX-13	MWX-14
Calcium	mg/L	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	24.8	0.82	N/A
Mercury	µg/L	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	24.2	13	N/A
Magnesium	mg/L	24.2	42.8	18	17.3	63.7	56.8	40.5	61.9	20.1	15.6	8.51	<0.04	<0.04	N/A
Sodium	mg/L	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	3.3	3.77	N/A
Iron	mg/L	<1	<1	<1	1	<1	<1	<1	<1	<1	<1	<1	<0.2	<0.2	N/A
Potassium	mg/L	<1	<1	3	2	<1	<1	<1	<1	4	2	2	<1	<1	N/A
Cadmium	µg/L	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	2	4	N/A
Chromium	µg/L	1660	242	52	12	<1	<1	4	<1	4	984	300	<1	<1	N/A
Copper	µg/L	<1	<1	<1	<1	2	2	<1	<1	<1	<1	<1	620	16	N/A
Lead	µg/L	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<1	<1	N/A
Manganese	µg/L	220	700	160	170	220	160	690	500	260	280	100	16	306	N/A
Nickel	µg/L	<2	<2	<2	<2	<2	7	<2	13	<2	<2	<2	<2	<2	N/A
Zinc	µg/L	11	21	14	15	42	47	12	49	22	10	7	3	3	N/A
Biochemical Oxygen Demand	mg/L	3	3	5	6	9	8	2	8	8	3	4	1	1	N/A
Chemical Oxygen Demand	mg/L	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	24.2	13	N/A
Total Organic Carbon	mg/L	24.2	42.8	18	17.3	63.7	56.8	40.5	61.9	20.1	15.6	8.51	<0.04	<0.04	N/A

Note:
(a) MWX-14 is not accessible due to safety considerations.

TABLE F5.3 GROUNDWATER MONITORING RESULTS (JUNE 2024)

Parameters	Units	MWX-1	MWX-2	MWX-3	MWX-4	MWX-5	MWX-6	MWX-7	MWX-8	MWX-9	MWX-10	MWX-11	MWX-12	MWX-13	MWX-14
Water Level	mPD	3.66	3.54	3.68	3.59	2.58	2.6	3.22	4.16	4.76	N/A [a]	4.63	7	38.22	N/A [b]
Bicarbonate Alkalinity as CaCO3	mg/L	143	226	214	143	106	<1	12	16	199	N/A	232	58	14	N/A
Carbonate Alkalinity as CaCO3	mg/L	<1	<1	<1	<1	4	139	100	37	<1	N/A	<1	<1	<1	N/A
Total Alkalinity as CaCO3	mg/L	143	226	214	143	110	161	112	54	199	N/A	232	58	14	N/A
pH Value	pH Unit	7.6	8	7.8	8.1	8.5	11.1	10.4	9.6	7.8	N/A	8	6.7	5.6	N/A
Electrical Conductivity	µS/cm	1120	3690	1080	769	729	1150	1180	2510	1240	N/A	697	302	93	N/A
Ammonia	mg/L	0.14	0.47	0.4	0.42	0.19	3.49	5.59	10	0.01	N/A	0.03	0.04	0.03	N/A
Chloride	mg/L	217	878	142	98	83	191	239	705	146	N/A	45	20	14	N/A
Nitrite	mg/L	<0.01	0.02	<0.01	0.02	0.02	0.02	0.02	0.02	0.02	N/A	0.02	<0.01	<0.01	N/A
Phosphorus	mg/L	<0.01	0.02	0.01	0.01	0.01	<0.01	<0.01	<0.01	0.01	N/A	<0.01	0.02	0.01	N/A
Sulphate	mg/L	64	268	105	81	81	88	102	115	150	N/A	67	60	3	N/A
Sulphide	mg/L	<0.1	<0.1	<0.1	0.2	0.4	9.4	5.1	5.6	<0.1	N/A	<0.1	<0.1	<0.1	N/A
Total Kjeldahl Nitrogen	mg/L	0.3	0.5	0.6	0.7	0.5	4.3	6.7	10.6	0.3	N/A	0.2	0.1	0.1	N/A
Nitrate	mg/L	0.56	1.38	0.02	0.06	<0.01	<0.01	<0.01	<0.01	<0.01	N/A	0.24	0.04	0.12	N/A
Total Nitrogen	mg/L	0.8	1.9	0.6	0.7	0.5	4.3	6.7	10.6	0.3	N/A	100	0.2	0.2	N/A
Boron	µg/L	170	510	170	180	240	200	240	350	360	N/A	88.6	20	10	N/A

Parameters	Units	MWX-1	MWX-2	MWX-3	MWX-4	MWX-5	MWX-6	MWX-7	MWX-8	MWX-9	MWX-10	MWX-11	MWX-12	MWX-13	MWX-14
Calcium	mg/L	137	514	89.1	71.2	90.7	156	173	371	116	N/A	<0.04	24.2	13	N/A
Mercury	µg/L	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	N/A	8.51	<0.04	<0.04	N/A
Magnesium	mg/L	18.6	34.5	22.4	18	41	54.8	46.4	59	18.4	N/A	<0.2	3.3	3.77	N/A
Sodium	mg/L	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	N/A	<1	<0.2	<0.2	N/A
Iron	mg/L	<1	<1	<1	<1	<1	<1	<1	<1	<1	N/A	2	<1	<1	N/A
Potassium	mg/L	<1	1	2	<1	1	1	1	<1	3	N/A	<1	2	4	N/A
Cadmium	µg/L	<1	<1	<1	<1	<1	2	<1	<1	<1	N/A	300	<1	<1	N/A
Chromium	µg/L	210	218	715	26	9	<1	<1	2	17	N/A	<1	620	16	N/A
Copper	µg/L	<1	<1	<1	<1	<1	1	2	1	<1	N/A	<10	<1	<1	N/A
Lead	µg/L	<10	<10	<10	<10	<10	<10	11	<10	<10	N/A	100	16	306	N/A
Manganese	µg/L	<2	<2	<2	<2	<2	5	4	3	<2	N/A	<2	<2	<2	N/A
Nickel	µg/L	6	6	10	10	13	45	47	35	19	N/A	7	3	3	N/A
Zinc	µg/L	2	1	3	4	6	12	14	11	6	N/A	4	1	1	N/A
Biochemical Oxygen Demand	mg/L	137	514	89.1	71.2	90.7	156	173	371	116	N/A	<0.04	24.2	13	N/A
Chemical Oxygen Demand	mg/L	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	N/A	8.51	<0.04	<0.04	N/A
Total Organic Carbon	mg/L	18.6	34.5	22.4	18	41	54.8	46.4	59	18.4	N/A	<0.2	3.3	3.77	N/A

Note:
(a) Monitoring well MWX-10 was under maintenance.
(b) Monitoring well MWX-14 is not accessible due to safety considerations.

FIGURE F5.1 GRAPHICAL PRESENTATION FOR GROUNDWATER MONITORING (MWX-1)

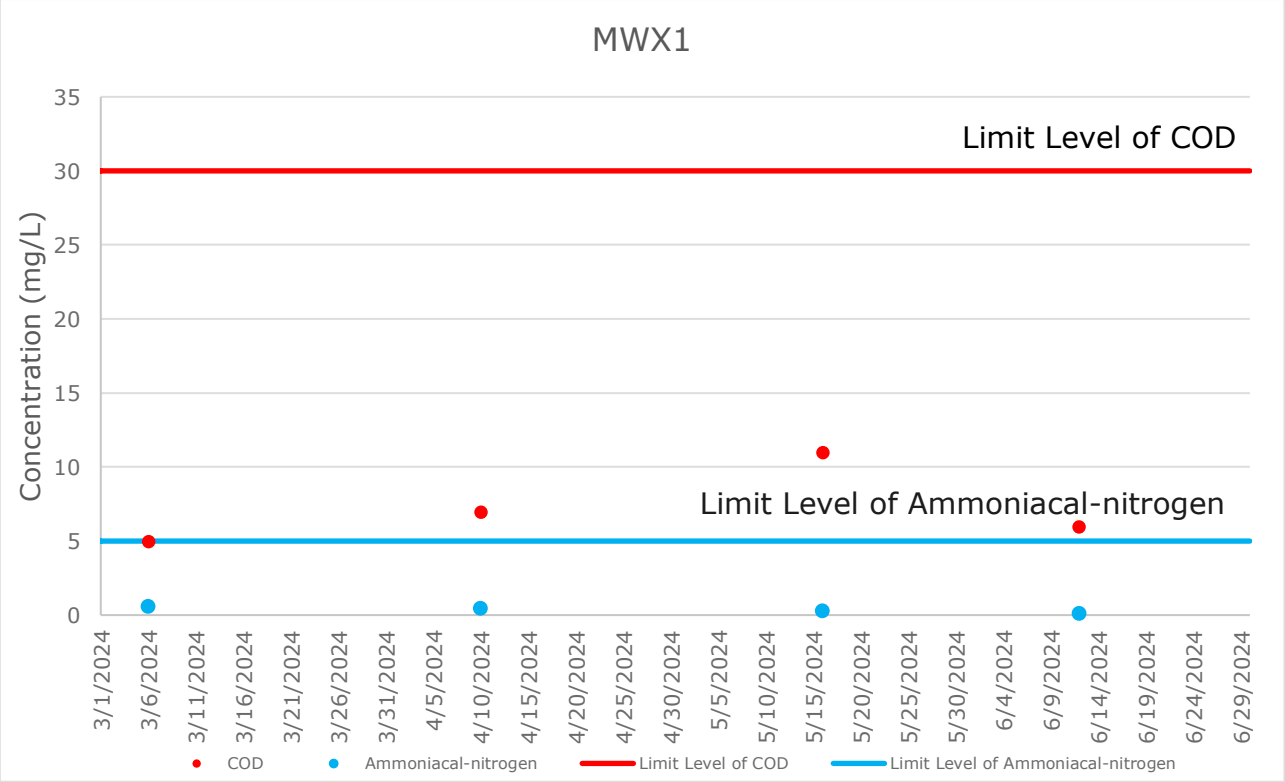


FIGURE F5.2 GRAPHICAL PRESENTATION FOR GROUNDWATER MONITORING (MWX-2)

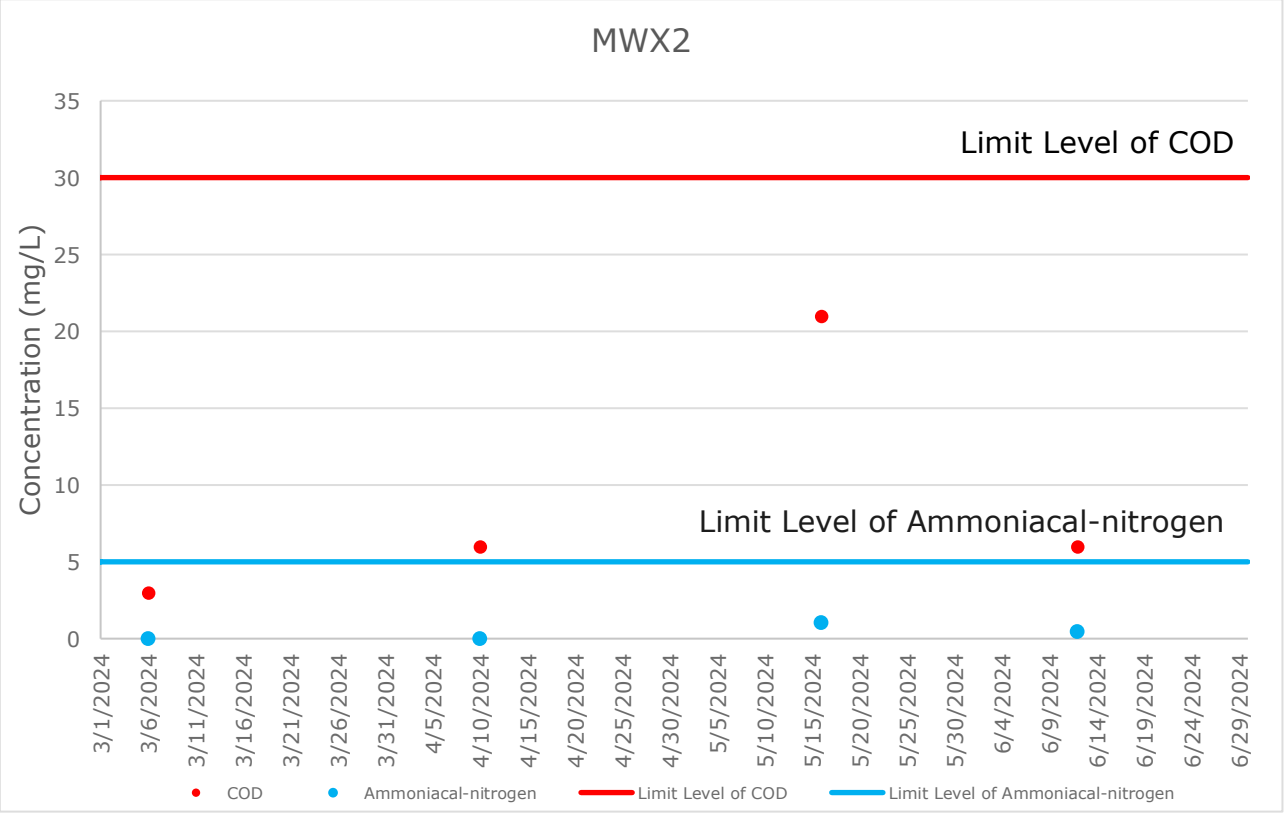


FIGURE F5.3 GRAPHICAL PRESENTATION FOR GROUNDWATER MONITORING (MWX-3)

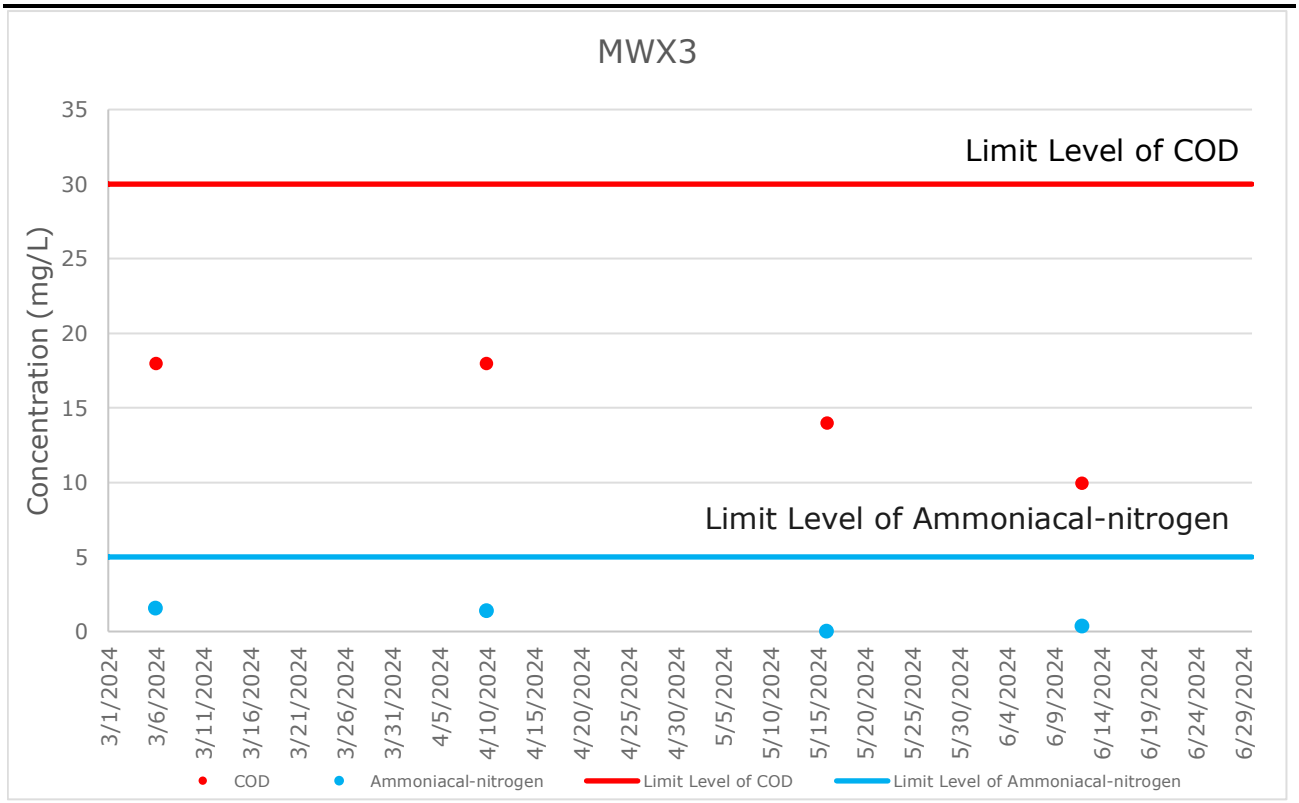


FIGURE F5.4 GRAPHICAL PRESENTATION FOR GROUNDWATER MONITORING (MWX-4)

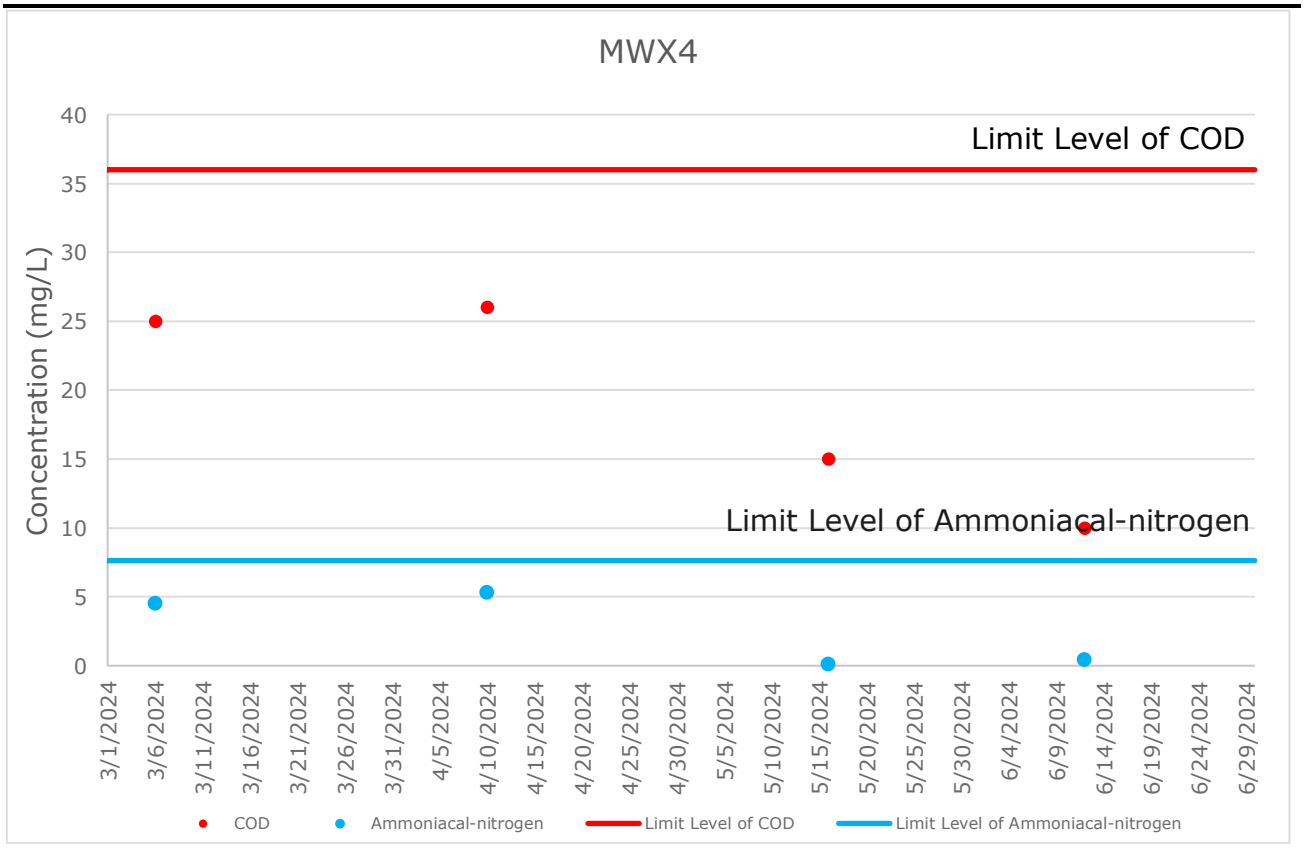


FIGURE F5.5 GRAPHICAL PRESENTATION FOR GROUNDWATER MONITORING (MWX-5)

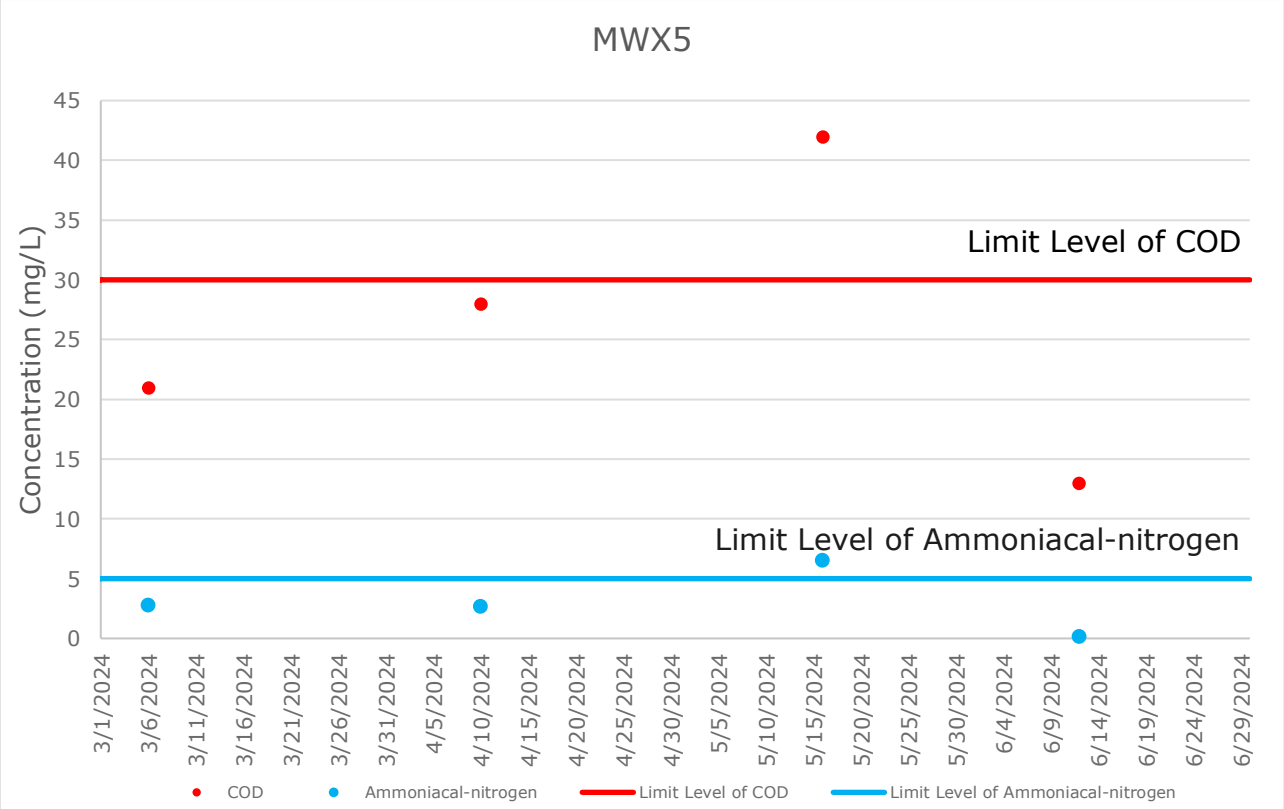


FIGURE F5.6 GRAPHICAL PRESENTATION FOR GROUNDWATER MONITORING (MWX-6)

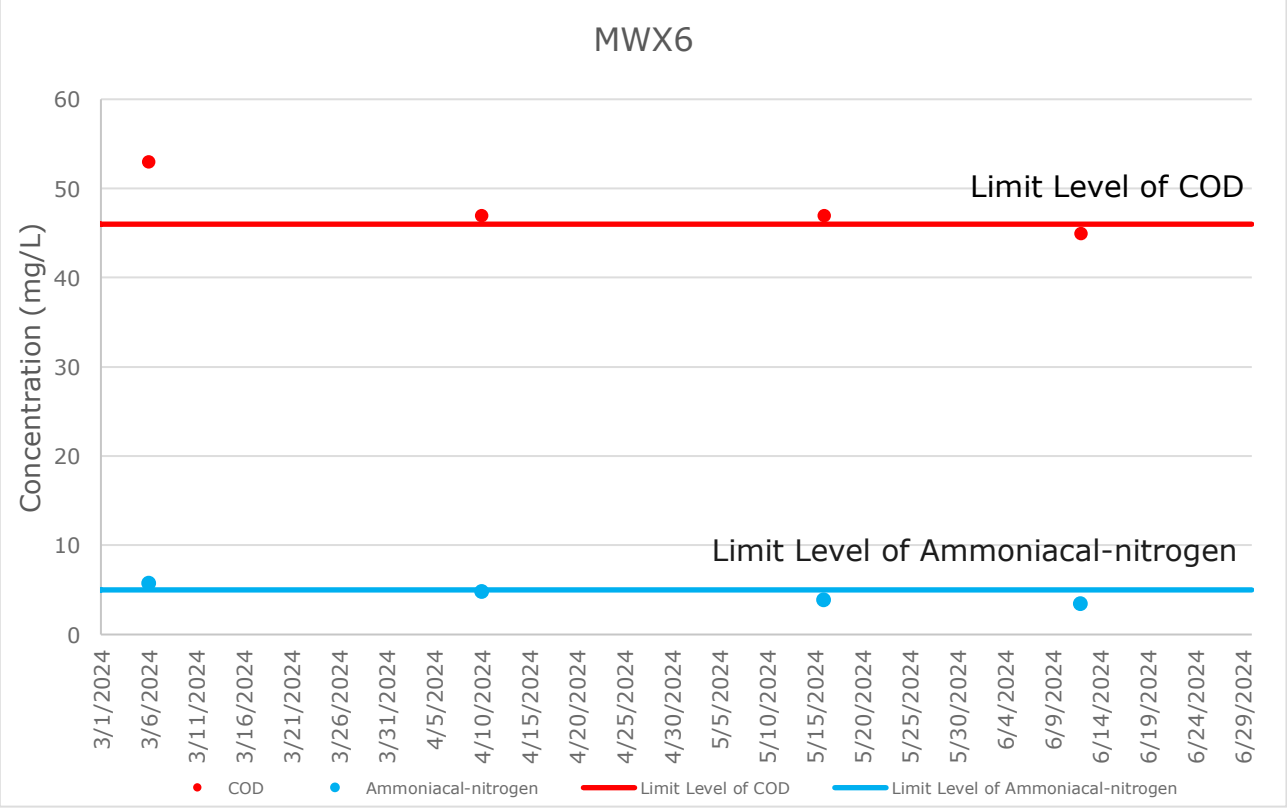


FIGURE F5.7 GRAPHICAL PRESENTATION FOR GROUNDWATER MONITORING (MWX-7)

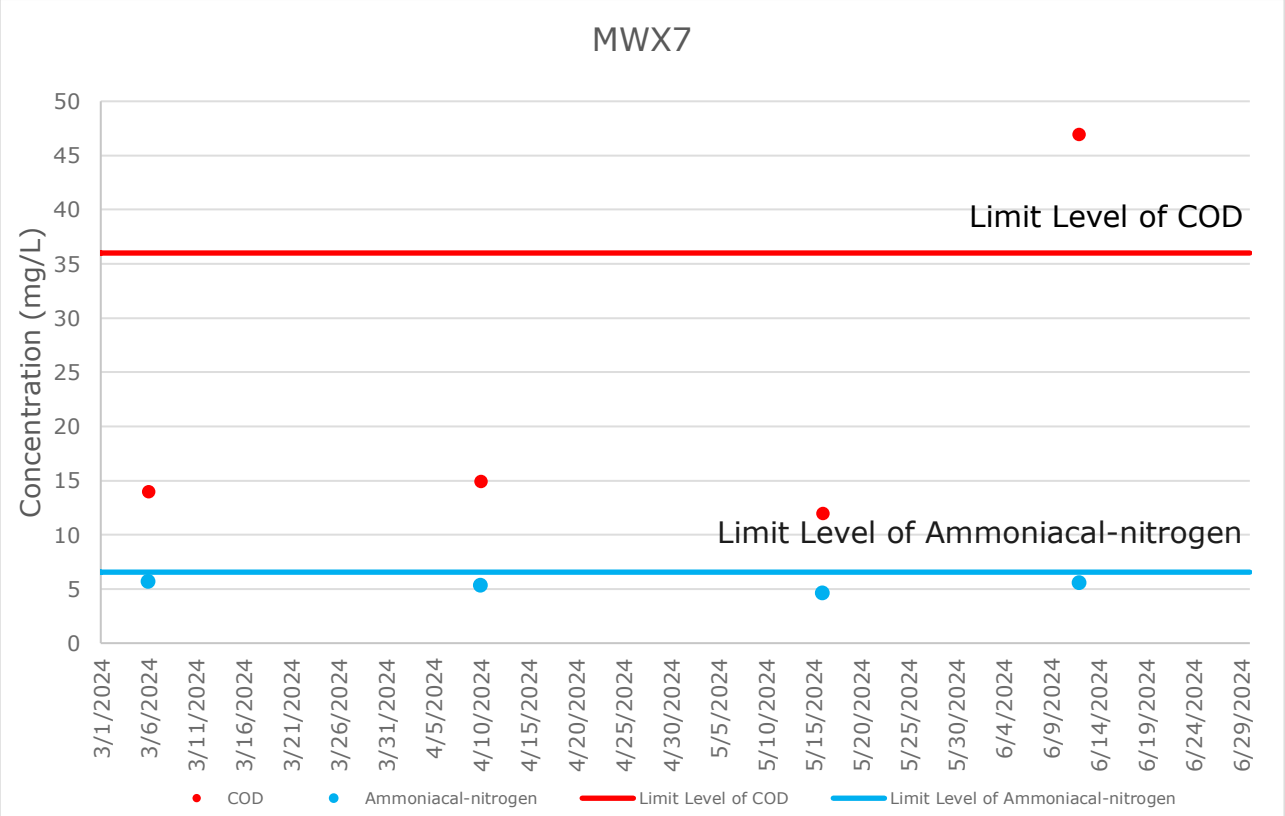


FIGURE F5.8 GRAPHICAL PRESENTATION FOR GROUNDWATER MONITORING (MWX-8)

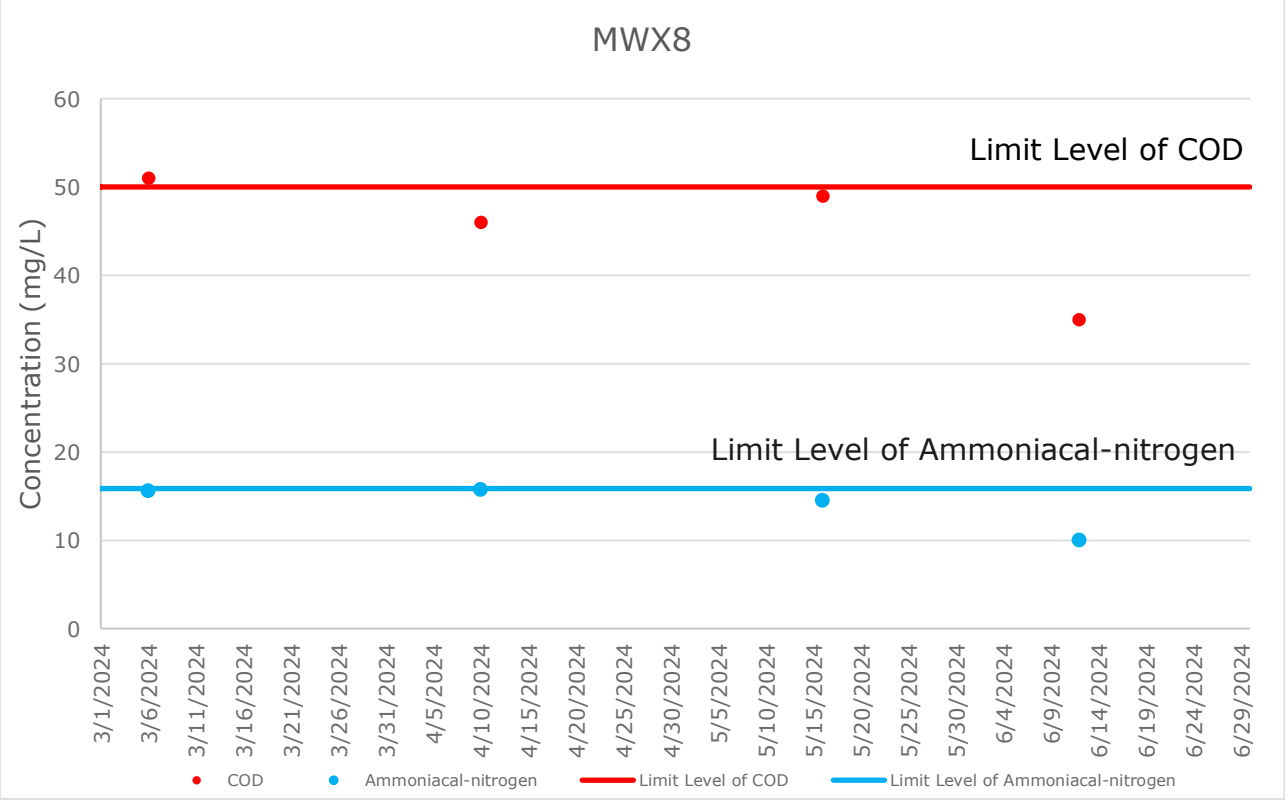


FIGURE F5.9 GRAPHICAL PRESENTATION FOR GROUNDWATER MONITORING (MWX-9)

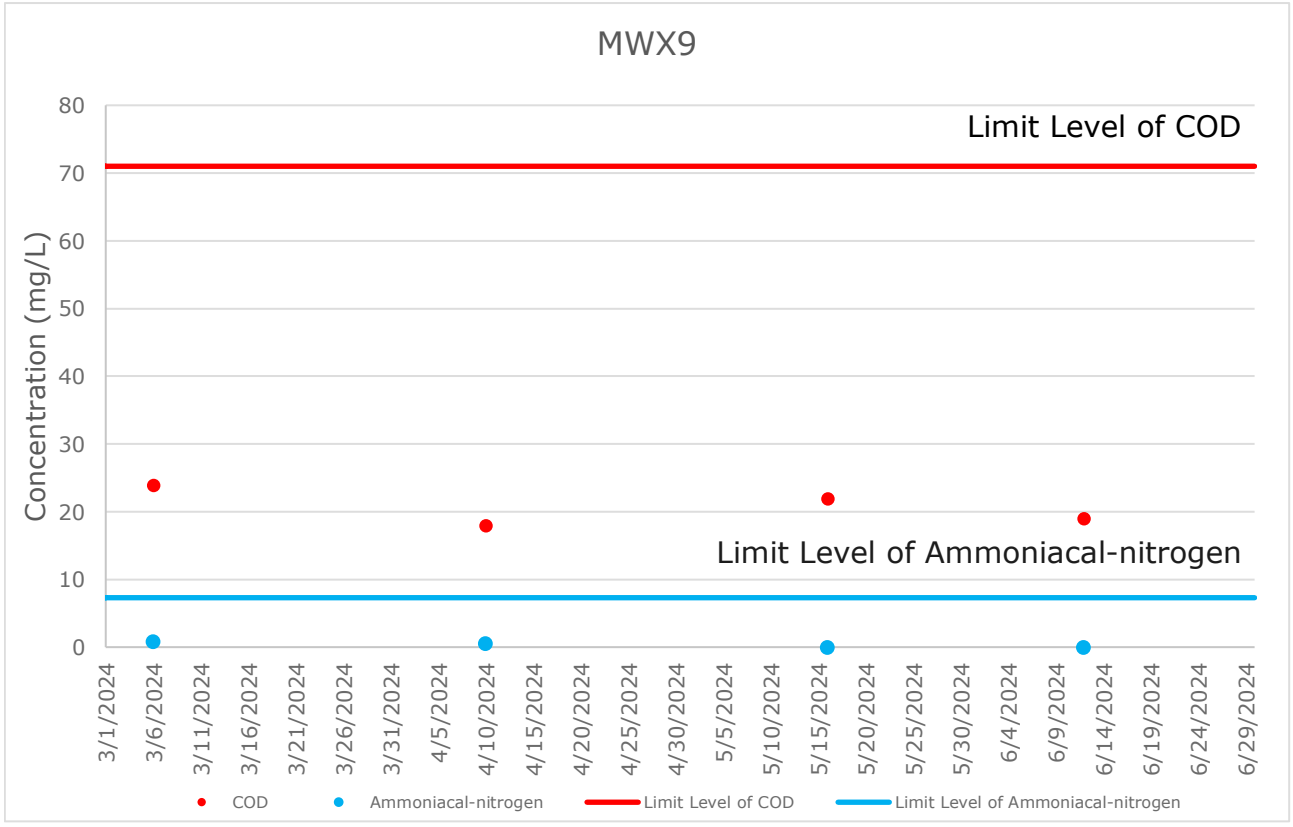


FIGURE F5.10 GRAPHICAL PRESENTATION FOR GROUNDWATER MONITORING (MWX-10)

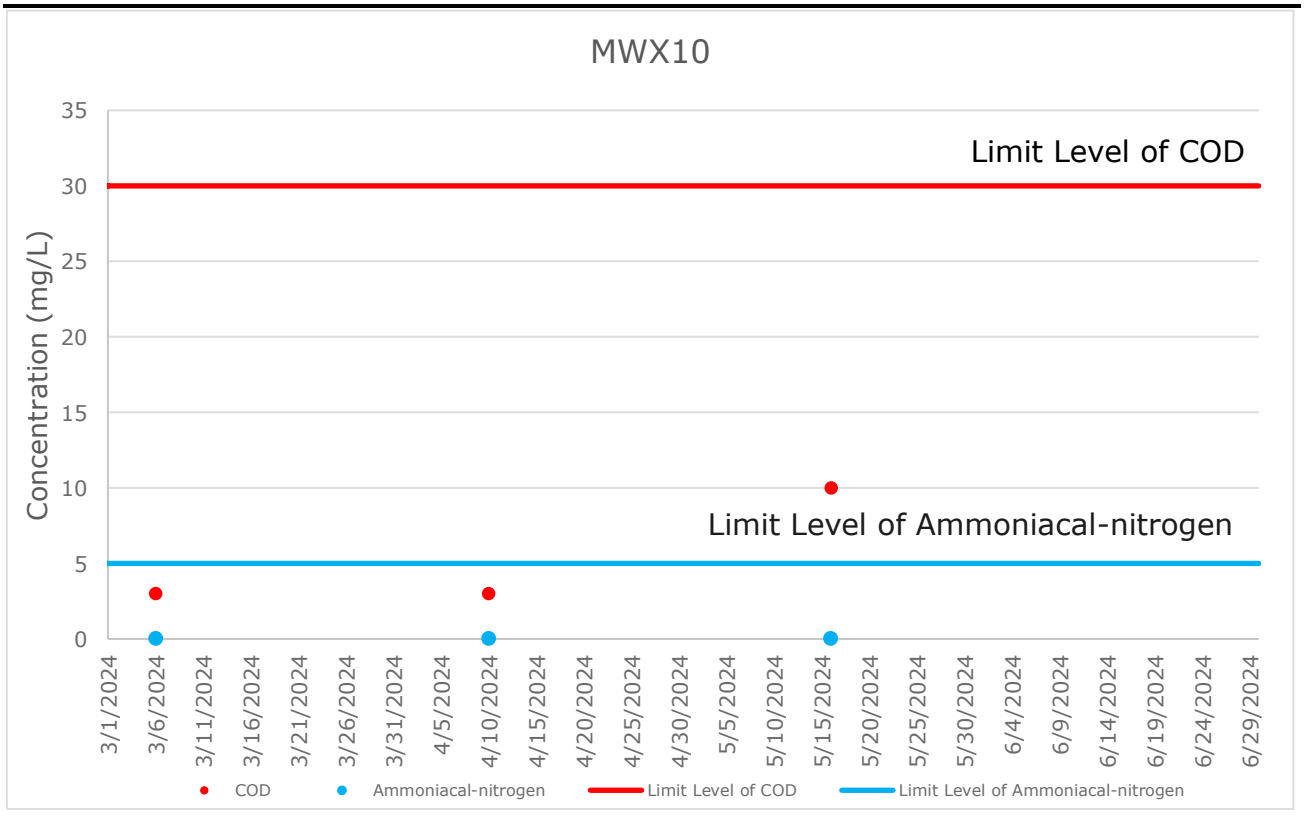


FIGURE F5.11 GRAPHICAL PRESENTATION FOR GROUNDWATER MONITORING (MWX-11)

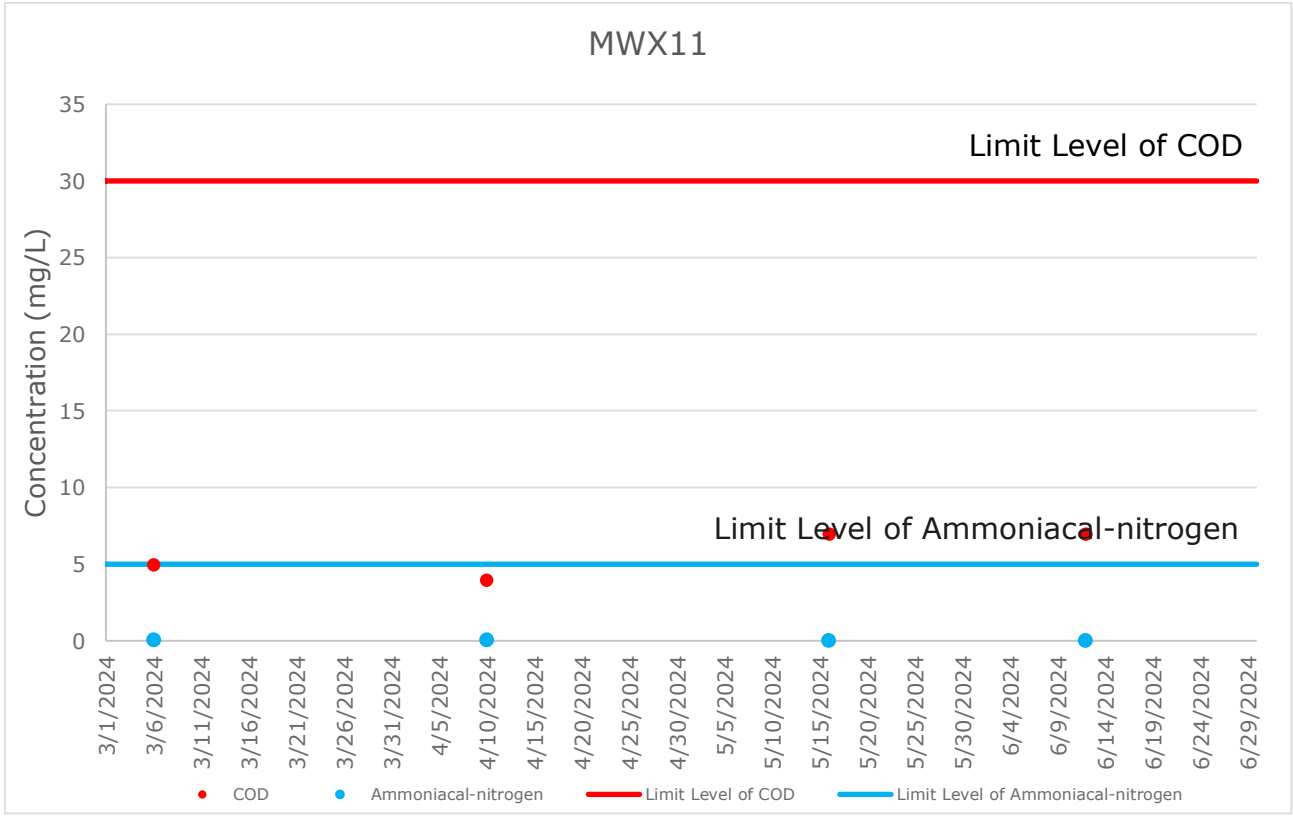


FIGURE F5.12 GRAPHICAL PRESENTATION FOR GROUNDWATER MONITORING (MWX-12)

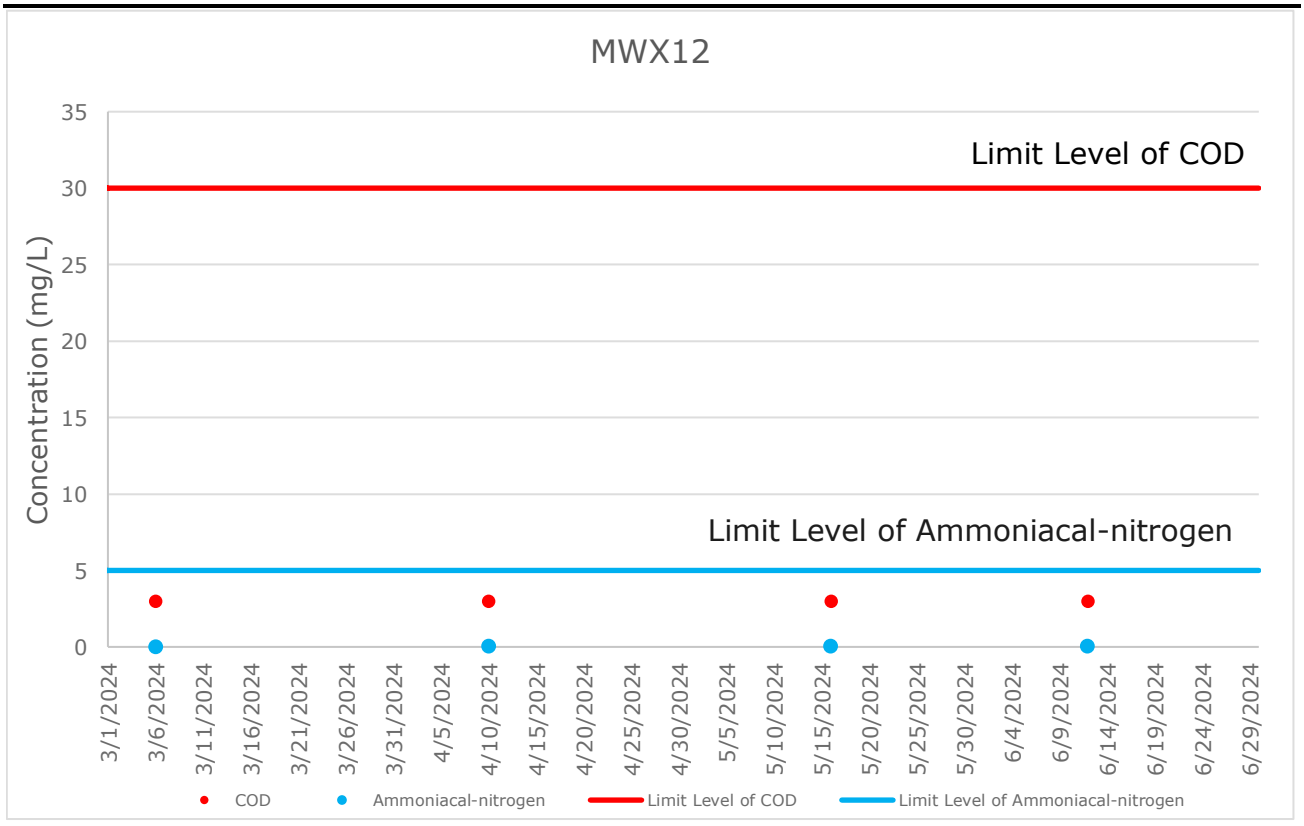


FIGURE F5.13 GRAPHICAL PRESENTATION FOR GROUNDWATER MONITORING (MWX-13)

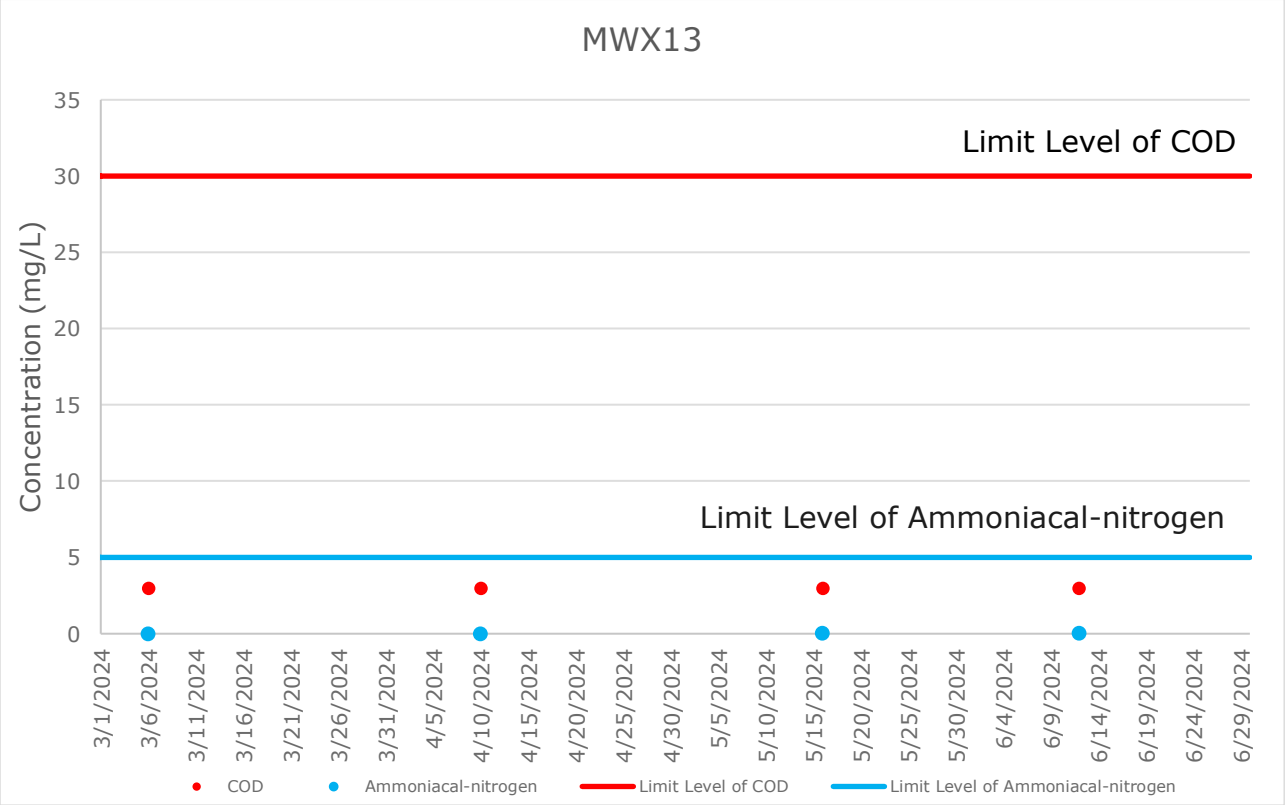
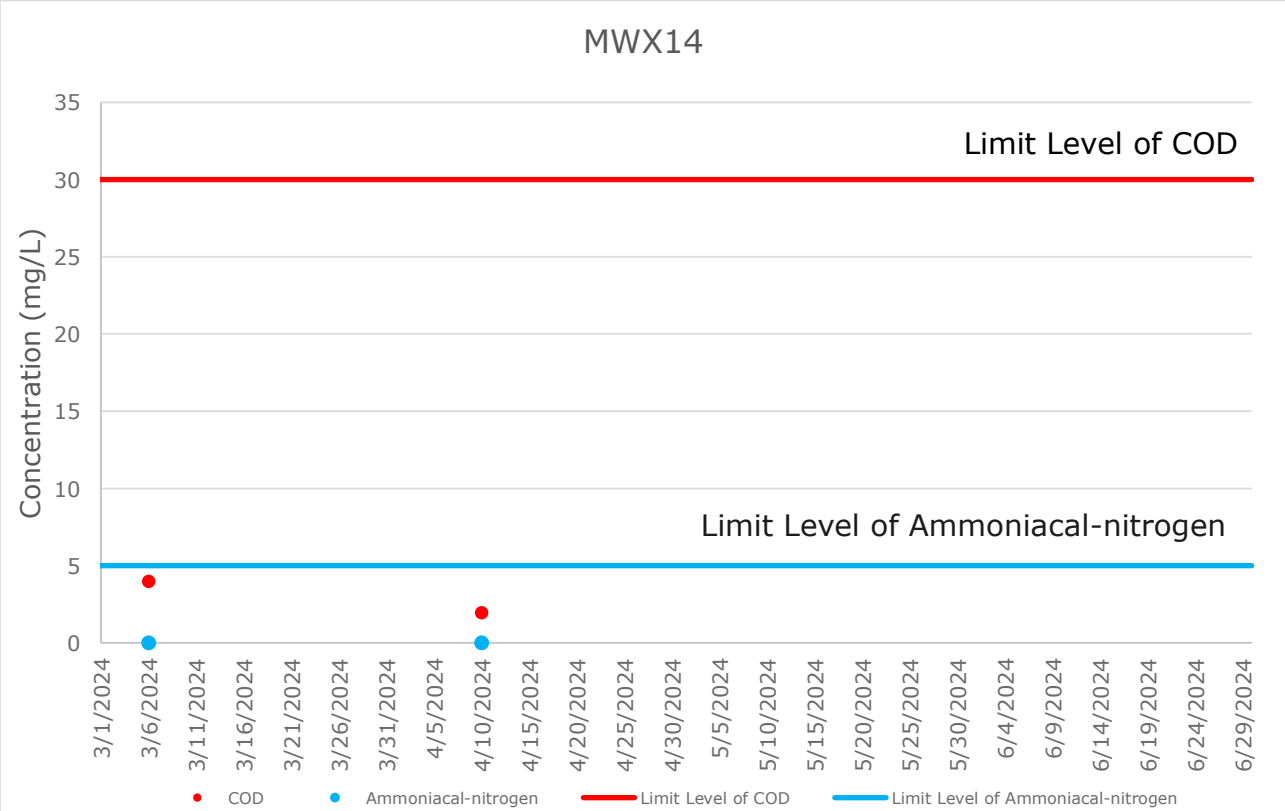


FIGURE F5.14 GRAPHICAL PRESENTATION FOR GROUNDWATER MONITORING (MWX-14)



ANNEX F6 INVESTIGATION REPORTS OF ENVIRONMENTAL QUALITY LIMIT EXCEEDANCE

Investigation Report of Environmental Quality Limit Exceedance

Project	South East New Territories (SENT) Landfill Extension
Date	10 April 2024
Time	16:10
Monitoring Location	MWX-6
Parameter	Chemical Oxygen Demand (COD)
Limit Level	>46 mg/L
Measured Level	47 mg/L
Possible reason	Groundwater contaminated with leachate is commonly characterized by high COD and ammoniacal-nitrogen levels as a result of degradation of organic matters in the waste. The ammoniacal-nitrogen monitoring result at groundwater monitoring wells MWX-6 (4.86 mg/L) and the COD monitoring results of the groundwater monitoring wells adjacent to MWX-6 (MWX-5: 28 mg/L and MWX-7: 15 mg/L) are well within the respective limit levels. Hence, there is a low possibility of the elevation of COD level at MWX-6 is due to leachate contamination from SENTX operation or at least it is not conclusive to base on these results to demonstrate exceedance was due to leachate contamination. In accordance with Table 4.5b of the updated EM&A Manual, repeat measurement was conducted on 3 May 2024 to confirm findings. COD concentration of 47 mg/L was measured at MWX-6 during the sampling event. MWX-6 showed consecutive exceedance of groundwater quality limit. According to the findings of the desktop review commissioned by GVL and EPD (the Employer) in May 2021 to investigate the potential sources of the elevated methane levels at the perimeter landfill gas monitoring wells at SENTX, pockets of organic matters are identified in the fill materials of the SENTX site upon review of the historical site investigation borehole logs at the Project Site area. It is possible that the elevated COD concentration measured at MWX-6 on 10 April 2024 could be due to localised organic matters within or around the monitoring well and background fluctuation. Due to the presence of influencing factor from non-project source, there is no adequate evidence showing that the COD level exceedance measured at MWX-6 on 10 April 2024 was deemed to Project-related activities. It should also be noted that although the COD level exceeded the limit level of the EM&A programme, it is still well within the WPCO effluent discharge limit of COD (80 mg/L) and the standard for effluents discharged into the inshore waters of the Junk Bay Water Control Zone as stipulated under Technical Memorandum Standards for Effluents Discharged into Drainage and Sewerage Systems, Inland

	and Coastal Waters (80 mg/L). The slight exceedance of COD at MWX-6 on 10 April 2024 will not cause adverse water quality impact to the Junk Bay Water Control Zone.
Action Taken / Action to be Taken	Examination of environmental performance of the Project will be continued during the weekly inspections. The Contractor is reminded to implement relevant and appropriate mitigation measures according to the updated EM&A Manual to avoid any exceedance of the Action and Limit Levels. ET will continue to closely monitor the groundwater quality monitoring results and collect additional data for investigation and further review, if necessary.
Remarks	-

Prepared by: Abbey Lau
Designation: Environmental Team
Date: 27 May 2024

Investigation Report of Environmental Quality Limit Exceedance

Project	South East New Territories (SENT) Landfill Extension
Date	3 May 2024
Time	MWX-5: 11:24 MWX-6: 11:10
Monitoring Location	MWX-5, MWX-6
Parameter	MWX-5: Ammoniacal-nitrogen and Chemical Oxygen Demand (COD) MWX-6: COD
Limit Level	Ammoniacal-nitrogen: MWX-5: >5 mg /L COD: MWX-5: >30 mg /L MWX-6: >46 mg /L
Measured Level	Ammoniacal-nitrogen: MWX-5: 6.59 mg /L COD: MWX-5: 42 mg /L MWX-6: 47 mg /L
Possible reason	Groundwater contaminated with leachate is commonly characterized by high COD and ammoniacal-nitrogen levels as a result of degradation of organic matters in the waste. The ammoniacal-nitrogen monitoring result at groundwater monitoring well MWX-6 (3.92 mg/L) and at groundwater monitoring wells adjacent to MWX-5 (MWX-4: 0.09 mg/L) are well within the respective limit levels. The COD monitoring results of the groundwater monitoring wells adjacent to MWX-5 and MWX-6 (MWX-4: 15 mg/L, MWX-7: 12 mg/L) are well within the respective limit levels. Hence, there are a low possibility of the elevation of ammoniacal-nitrogen level at MWX-5 and the elevation of COD level at MWX-5 and MWX-6 are due to leachate contamination from SENTX operation or at least they are not conclusive to base on these results to demonstrate exceedances were due to leachate contamination. In accordance with Table 4.5b of the updated EM&A Manual, repeat measurement was conducted on 12 June 2024 to confirm findings. Ammoniacal-nitrogen concentration of 0.19 mg/L (below the Limit Level) was measured at MWX-5 and COD concentration of 13 mg/L and 45 mg/L (below the Limit Level) were measured at MWX-5 and MWX-6, respectively, during the sampling event, which demonstrate no consecutive groundwater quality impact at the monitoring locations. According to the findings of the desktop review commissioned by GVL and EPD (the Employer) in May 2021 to investigate the potential sources of the elevated methane levels at the perimeter landfill gas monitoring wells at SENTX, pockets of organic matters are identified in the fill materials of the SENTX site upon review of the historical site investigation borehole logs at the Project Site area. It is possible that the elevated ammoniacal-nitrogen and COD concentration measured at MWX-5 and elevated COD concentration measured at MWX-6 on 3

	May 2024 could be due to localised organic matters within or around the monitoring wells and background fluctuation. Due to the presence of influencing factor from non-project source, there is no adequate evidence showing that the ammoniacal-nitrogen and COD level exceedances measured at MWX-5 and COD level exceedance measured at MWX-6 on 3 May 2024 were deemed to Project-related activities. It should also be noted that although the COD level exceeded the limit level of the EM&A programme, it is still well within the WPCO effluent discharge limit of COD (80 mg/L) and the standard for effluents discharged into the inshore waters of the Junk Bay Water Control Zone as stipulated under Technical Memorandum Standards for Effluents Discharged into Drainage and Sewerage Systems, Inland and Coastal Waters (80 mg/L). The slight exceedance of ammoniacal-nitrogen and COD at MWX-5 and COD at MWX-6 on 3 May 2024 will not cause adverse water quality impact to the Junk Bay Water Control Zone.
Action Taken / Action to be Taken	Examination of environmental performance of the Project will be continued during the weekly inspections. The Contractor is reminded to implement relevant and appropriate mitigation measures according to the updated EM&A Manual to avoid any exceedance of the Action and Limit Levels. ET will continue to closely monitor the groundwater quality monitoring results and collect additional data for investigation and further review, if necessary.
Remarks	-

Prepared by: Abbey Lau
Designation: Environmental Team
Date: 5 July 2024

Investigation Report of Environmental Quality Limit Exceedance

Project	South East New Territories (SENT) Landfill Extension
Date	6 May 2024
Time	DP3: 09:48 DP6: 10:13 DP6 (Duplicate): 10:18
Monitoring Location	DP3 and DP6
Parameter	Surface Water (Ammoniacal-nitrogen and Suspended Solids (SS))
Limit Level	DP3: Ammoniacal-nitrogen: >0.5 mg /L DP6: SS: >20 mg /L
Measured Level	DP3: Ammoniacal-nitrogen: 1.38 mg /L DP6: SS: 22.0 mg /L DP6 (Duplicate): SS: 26.3 mg /L
Possible reason	From the on-site rainfall record of May 2024, heavy rainfall events were recorded on 4 May 2024 before the sampling event. Red and amber rainstorm warning signal were also issued by the Hong Kong Observatory on 4 May 2024. No works which may lead to potential increase in ammoniacal-nitrogen level (e.g. potential leakage of leachate) and SS increase (e.g. active stockpiling and excavation works) were conducted in the vicinity of surface water channel leading to DP3 and DP6, respectively, on the sampling day based on on-site observations and construction activities described by the Contractor. During the sampling event, no raining was recorded and no other sources (e.g. other project sites) was identified in the vicinity of surface water channel leading to DP3 and DP6 which might cause the ammoniacal-nitrogen exceedance at DP3 and SS exceedance at DP6. Site surface runoff at DP3 and DP6 channel was treated by the Wetsep prior to discharge. The contaminated runoff from the unpaved areas during the previous rainfall events could be the potential source of ammoniacal-nitrogen and SS contributing to the exceedance. The ammoniacal-nitrogen exceedance at DP3 and SS exceedance at DP6 were therefore deemed to Project-related activities. In accordance with Table 4.5b of the updated EM&A Manual, repeat measurement was conducted on 30 May 2024 to confirm findings. Surface water samples with ammoniacal-nitrogen concentration of 0.18 mg/L and 0.16 mg/L (below the Limit Level) were sampled at DP3, which demonstrate no consecutive surface water quality impact at the monitoring location. SS concentration of 34.3 mg/L was measured at DP6 during the sampling event. DP6 showed consecutive exceedance of surface water quality (SS) limit.

Action Taken / Action to be Taken	In accordance with Table 4.5b of the updated EM&A Manual, the monitoring frequency shall be increased to weekly until no exceedance of Limit Level. It should be noted that the turnaround time for the laboratory analysis of the surface water sample is 5 working days and the preliminary results for the monitoring event conducted on 6 May 2024 were available on 13 May 2024. Repeat measurement was conducted on 16 May (unable to collect water sample due to insufficient flow) and 30 May 2024, and the ammoniacal-nitrogen results at DP3 are well below the Limit Level. Hence, the weekly surface water monitoring at DP3 shall not be triggered. While the surface water monitoring frequency (for SS) at DP6 shall be increased to weekly in accordance with Table 4.5b of the updated EM&A Manual until no exceedance of Limit Level. Examination of environmental performance of the Project will be continued during the weekly inspections. The Contractor is reminded to implement relevant and appropriate mitigation measures according to the updated EM&A Manual to avoid any exceedance of the Action and Limit Levels. In addition, the Contractor shall review the efficiency of the Wetsep at DP3 and DP6 and monitor the Wetsep operation regularly to ensure they are functioning properly at all times.
Remarks	-

Prepared by: Abbey Lau
Designation: Environmental Team
Date: 6 June 2024

Investigation Report of Environmental Quality Limit Exceedance

Project	South East New Territories (SENT) Landfill Extension
Date	30 May 2024
Time	14:27
Monitoring Location	DP6
Parameter	Suspended Solids (SS))
Limit Level	>20 mg /L
Measured Level	34.3 mg /L
Possible reason	From the on-site rainfall record of May 2024, heavy rainfall event was recorded on 27 May 2024 before the sampling event. Amber rainstorm warning signal was also issued by the Hong Kong Observatory on 27 and 28 May 2024. No works which may lead to potential increase in SS increase (e.g. active stockpiling and excavation works) was conducted in the vicinity of surface water channel leading to DP6 on the sampling day based on on-site observations and construction activities described by the Contractor. During the sampling event, no raining was recorded and no other sources (e.g. other project sites) was identified in the vicinity of surface water channel leading to DP6 which might cause the SS exceedance at DP6. Site surface runoff at DP6 channel was treated by the Wetsep prior to discharge. The contaminated runoff from the unpaved areas during the previous rainfall events could be the potential source of SS contributing to the exceedance. The SS exceedance at DP6 was therefore deemed to Project-related activities.
Action Taken / Action to be Taken	Weekly surface water quality monitoring (SS) shall be continued at DP6 until no exceedance of Limit Level in accordance with Table 4.5b of the updated EM&A Manual. Examination of environmental performance of the Project will be continued during the weekly inspections. The Contractor is reminded to implement relevant and appropriate mitigation measures according to the updated EM&A Manual to avoid any exceedance of the Action and Limit Levels. In addition, the Contractor shall review the efficiency of the Wetsep at DP6 and monitor the Wetsep operation regularly to ensure it is functioning properly at all times.
Remarks	-

Prepared by: Abbey Lau
Designation: Environmental Team
Date: 18 June 2024

Investigation Report of Environmental Quality Limit Exceedance

Project	South East New Territories (SENT) Landfill Extension
Date	12 June 2024
Time	10:55
Monitoring Location	MWX-7
Parameter	Chemical Oxygen Demand (COD)
Limit Level	>36 mg/L
Measured Level	47 mg/L
Possible reason	Groundwater contaminated with leachate is commonly characterized by high COD and ammoniacal-nitrogen levels as a result of degradation of organic matters in the waste. The ammoniacal-nitrogen monitoring result at groundwater monitoring wells MWX-7 (5.59 mg/L) and the COD monitoring results of the groundwater monitoring wells adjacent to MWX-7 (MWX-6: 45 mg/L and MWX-8: 35 mg/L) are well within the respective limit levels. Hence, there is a low possibility of the elevation of COD level at MWX-7 is due to leachate contamination from SENTX operation or at least it is not conclusive to base on these results to demonstrate exceedance was due to leachate contamination. In accordance with Table 4.5b of the updated EM&A Manual, repeat measurement was conducted on 5 July 2024 to confirm findings. COD concentration of 49 mg/L was measured at MWX-7 during the sampling event. MWX-7 showed consecutive exceedance of groundwater quality limit. According to the findings of the desktop review commissioned by GVL and EPD (the Employer) in May 2021 to investigate the potential sources of the elevated methane levels at the perimeter landfill gas monitoring wells at SENTX, pockets of organic matters are identified in the fill materials of the SENTX site upon review of the historical site investigation borehole logs at the Project Site area. It is possible that the elevated COD concentration measured at MWX-7 on 12 June 2024 could be due to localised organic matters within or around the monitoring well and background fluctuation. Due to the presence of influencing factor from non-project source, there is no adequate evidence showing that the COD level exceedance measured at MWX-7 on 12 June 2024 was deemed to Project-related activities. It should also be noted that although the COD level exceeded the limit level of the EM&A programme, it is still well within the WPCO effluent discharge limit of COD (80 mg/L) and the standard for effluents discharged into the inshore waters of the Junk Bay Water Control Zone as stipulated under Technical Memorandum Standards for Effluents Discharged into Drainage and Sewerage Systems, Inland

	and Coastal Waters (80 mg/L). The slight exceedance of COD at MWX-7 on 12 June 2024 will not cause adverse water quality impact to the Junk Bay Water Control Zone.
Action Taken / Action to be Taken	Examination of environmental performance of the Project will be continued during the weekly inspections. The Contractor is reminded to implement relevant and appropriate mitigation measures according to the updated EM&A Manual to avoid any exceedance of the Action and Limit Levels. ET will continue to closely monitor the groundwater quality monitoring results and collect additional data for investigation and further review, if necessary.
Remarks	-

Prepared by: Abbey Lau
Designation: Environmental Team
Date: 25 July 2024

Investigation Report of Environmental Quality Limit Exceedance

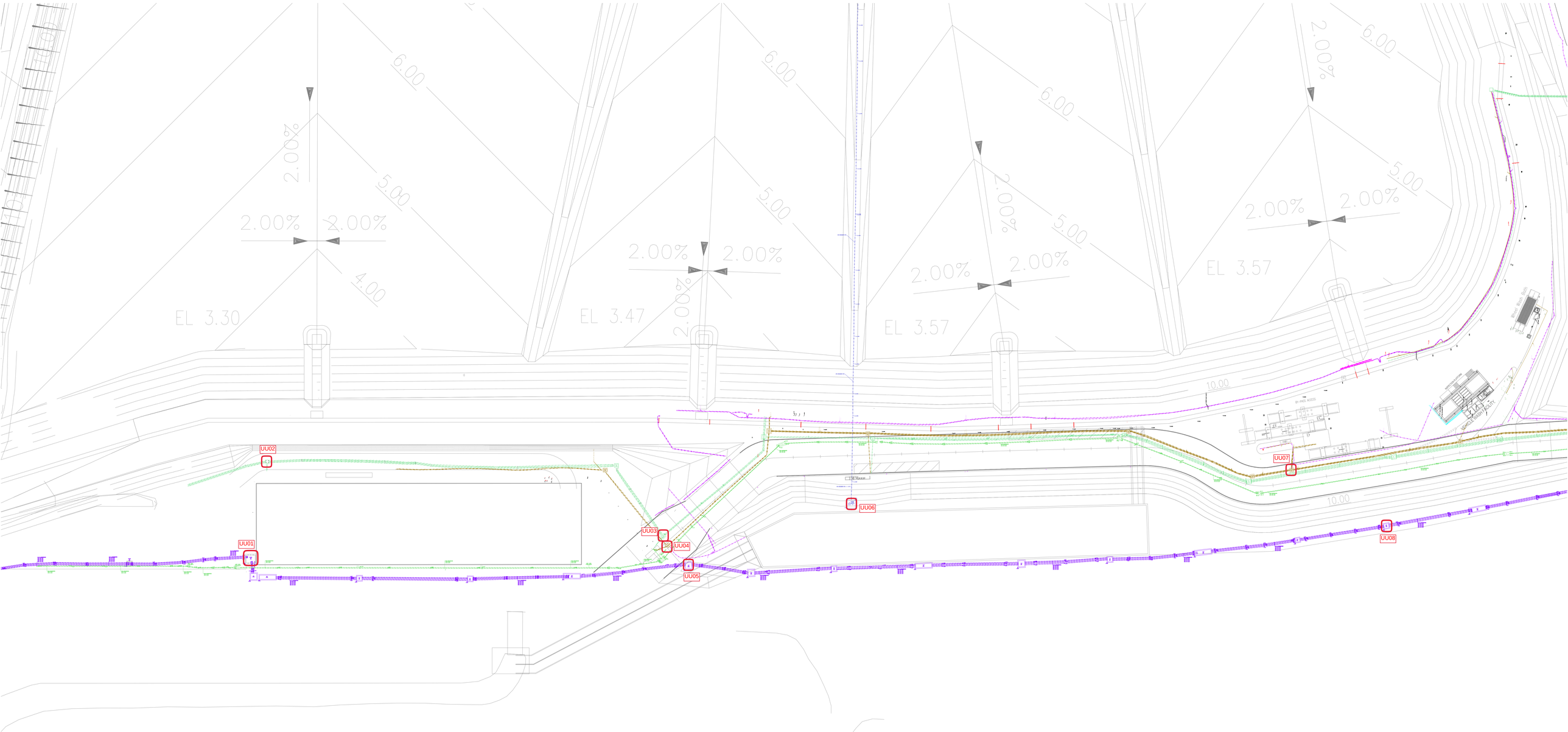
Project	South East New Territories (SENT) Landfill Extension
Date	12 June 2024
Time	10:08
Monitoring Location	DP4
Parameter	Suspended Solids (SS)
Limit Level	>20 mg/L
Measured Level	395 mg /L
Possible reason	From the on-site rainfall record of June 2024, heavy rainfall events was recorded on 9 June 2024 before the sampling event. Amber rainstorm warning signal was also issued by the Hong Kong Observatory on 9 June 2024. No works which may lead to potential SS increase (e.g. active stockpiling and excavation works) was conducted in the vicinity of surface water channel leading to DP4 on the sampling day based on on-site observations and construction activities described by the Contractor. Site surface runoff at DP4 channel was treated by the Wetsep prior to discharge. Yet during the sampling event, it was observed that the Wetsep was not functioning properly with reference to the on-site checking of the treated water at the outlet of the processing chamber of the Wetsep. During the sampling event, no raining was recorded and no other sources (e.g. other project sites) was identified in the vicinity of surface water channel leading to DP4 which might cause the SS exceedance at DP4. The contaminated runoff from the unpaved areas during the previous rainfall events could also be the potential source of SS contributing to the exceedance. The SS exceedance at DP4 was therefore deemed to Project-related activities. In accordance with Table 4.5b of the updated EM&A Manual, repeat measurement was conducted on 18 July 2024 to confirm findings. Surface water samples with SS concentration of 11.8 mg/L (below the Limit Level) was sampled at DP4, which demonstrate no consecutive surface water quality impact at the monitoring location.
Action Taken / Action to be Taken	In accordance with Table 4.5b of the updated EM&A Manual, the monitoring frequency shall be increased to weekly until no exceedance of Limit Level. It should be noted that the turnaround time for the laboratory analysis of the surface water sample is 5 working days and the preliminary result for the monitoring event conducted on 12 June 2024 was available on 20 June 2024. Repeat measurement was scheduled on 24 June 2024, 5 July 2024 and 9

	July 2024 (unable to collect water sample due to insufficient flow) and 18 July 2024, and the SS result at DP4 is well below the Limit Level. Hence, the weekly surface water monitoring at DP4 shall not be triggered. Examination of environmental performance of the Project will be continued during the weekly inspections. The Contractor is reminded to implement relevant and appropriate mitigation measures according to the updated EM&A Manual to avoid any exceedance of the Action and Limit Levels. In addition, the Contractor shall review the efficiency of the Wetsep near sediment trap and monitor the Wetsep operation regularly to ensure it is functioning properly at all times.
Remarks	-

Prepared by: Abbey Lau
Designation: Environmental Team
Date: 5 August 2024

ANNEX G LANDFILL GAS

ANNEX G1 LANDFILL GAS MONITORING LOCATIONS FOR SERVICE VOIDS, UTILITIES AND MANHOLES ALONG THE SITE BOUNDARY AND WITHIN THE SENTX SITE


6.00
5.00
4.00
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UU20
UU21
UU22
UU23
HARD STANDING
EPD BUILDING
CIVIL BUILDING
CAR PARK
LABORATORY BUILDING
MAINTENANCE BUILDING
EQUIPMENT STORAGE AREA (SOFT STANDING)
VEHICLE WASH FACILITY
INSPECTION PLATFORM
Wheel Wash Bath
LANDFILL GAS CONTROL ROOM & SWITCHROOM
DIESEL FUEL TANKS
PETROLEUM STORE
BIOPLANT BUILDING
EPD CONFERENCE ROOM
CAR PARK SHELTER
WATER TANK

ANNEX G2 LANDFILL GAS MONITORING RESULTS

TABLE G2.1 LANDFILL GAS MONITORING RESULTS AT PERIMETER LFG MONITORING WELLS (APRIL 2024)

Location	Water Level (mPD)	Methane (% (v/v))	Carbon Dioxide (% (v/v))	Oxygen (% (v/v))
LFG1	2.41	0.1	0.6	17.1
LFG2	3.19	0.1	0.4	19.9
LFG3	2.51	0.1	0.1	18.0
LFG4	2.22	0.1	0.1	19.2
LFG5	2.47	0.1	0.5	10.2
LFG6	2.2	0.1	0.3	19.1
LFG7	2.31	0.1	0.0	15.9
LFG8	2.12	0.1	0.1	18.8
LFG9	2.30	0.1	0.2	13.8
LFG10	1.92	0.1	0.1	18.6
LFG11	2.1	0.1	0.1	5.2
LFG12	1.84	0.1	0.1	18.2
LFG13	1.84	16.5	0.4	3.9
LFG14	1.81	0.1	0.1	17.7
LFG15	2.22	0.5	1.0	15.9
LFG16	2.11	0.0	0.1	18.9
LFG17	2.28	0.0	0.2	16.6
LFG18	2.43	0.0	0.7	15.3
LFG19	2.59	0.0	0.1	19.1
LFG20	2.54	0.0	0.5	17.7
LFG21	2.54	0.0	0.1	18.9
LFG22	2.47	0.0	0.1	18.8
LFG23	12.6	0.0	0.1	18.7
LFG24	5.71	0.0	0.1	18.9
GP1	Probe Bent	0.0	0.3	20.5
GP2 (shallow)	Probe Bent	0.0	1.4	17.5
GP2 (deep)	Probe Bent	0.0	0.1	20.2
GP3 (shallow)	Probe Bent	0.0	0.1	19.9
GP3 (deep)	Probe Bent	0.0	0.1	19.6
GP4 (shallow)	Probe Bent	0.0	0.5	18.9
GP4 (deep)	Probe Bent	0.0	0.2	18.9
GP5 (shallow)	Probe Bent	0.0	0.4	18.4
GP5 (deep)	37.62	0.0	0.1	18.6
GP6	35.83	0.0	0.9	17.2

Location	Water Level (mPD)	Methane (% (v/v))	Carbon Dioxide (% (v/v))	Oxygen (% (v/v))
GP7	35.47	0.0	0.1	18.8
GP12	1.9	0.1	0.1	20.2
GP15	2.21	0.1	0.0	19.1
P7	2.32	0.1	0.2	19.3
P8	2.48	0.1	0.1	19.3
P9	2.24	0.1	0.6	19.1

TABLE G2.2 LANDFILL GAS MONITORING RESULTS AT PERIMETER LFG MONITORING WELLS (MAY 2024)

Location	Water Level (mPD)	Methane (% (v/v))	Carbon Dioxide (% (v/v))	Oxygen (% (v/v))
LFG1	3.39	0.1	0.6	14.2
LFG2	3.38	0.1	0.7	20.9
LFG3	3.28	0.1	3.8	6.4
LFG4	2.77	0.1	1.7	3.6
LFG5	3.26	0.1	0.3	1.7
LFG6	3.05	0.1	0.4	19.4
LFG7	3.66	0.1	0.1	18.8
LFG8	4.26	0.1	0.1	20.0
LFG9	3.34	0.9	0.1	16.9
LFG10	3.31	1.3	0.2	9.2
LFG11	3.67	0.1	0.0	20.0
LFG12	3.27	0.3	0.0	20.1
LFG13	2.90	0.1	0.0	20.7
LFG14	2.79	0.3	0.0	20.5
LFG15	2.93	10.8	0.1	9.2
LFG16	3.74	0.1	0.1	20.2
LFG17	2.96	10.8	0.3	1.2
LFG18	3.97	0.1	0.1	20.4
LFG19	4.89	0.1	0.1	20.4
LFG20 [(a)]	N/A	N/A	N/A	N/A
LFG21	4.46	0.0	0.1	20.3
LFG22	4.4	0.0	0.1	20.3
LFG23	23.25	0.0	0.1	20.1
LFG24	6.32	0.0	0.1	20.1
GP1	Probe Bent	0.0	7.6	9.6
GP2 (shallow)	Probe Bent	0.0	1.1	18.0
GP2 (deep)	Probe Bent	0.0	0.2	19.9
GP3 (shallow)	Probe Bent	0.0	0.1	20.1
GP3 (deep)	Probe Bent	0.0	1.3	19.0
GP4 (shallow)	Probe Bent	0.0	1.0	19.5
GP4 (deep)	Probe Bent	0.0	4.2	15.3
GP5 (shallow)	Probe Bent	0.0	5.5	14.1
GP5 (deep)	39.94	0.0	0.1	20.0
GP6	40.06	0.0	5.6	15.2

Location	Water Level (mPD)	Methane (% (v/v))	Carbon Dioxide (% (v/v))	Oxygen (% (v/v))
GP7	36.7	0.0	0.1	20.0
GP12	2.68	0.1	0.2	19.9
GP15	3.11	0.1	0.0	20.1
P7	3.1	0.1	0.0	20.1
P8	3.33	0.1	0.2	20.9
P9	3.22	0.1	0.4	19.3

Note:

(a) The Monitoring well LFG20 was under maintenance.

TABLE G2.3 LANDFILL GAS MONITORING RESULTS AT PERIMETER LFG MONITORING WELLS (JUNE 2024)

Location	Water Level (mPD)	Methane (% (v/v))	Carbon Dioxide (% (v/v))	Oxygen (% (v/v))
LFG1	0.53	0.0	1.3	13.0
LFG2	3.14	0.0	1.6	18.3
LFG3	3.21	0.0	3.4	18.1
LFG4	3.08	0.0	0.1	19.9
LFG5	3.32	0.0	0.1	6.1
LFG6	3.28	0.0	0.2	19.8
LFG7	3.49	0.0	0.3	18.5
LFG8	3.18	0.0	0.1	20.2
LFG9	2.97	0.0	0.3	13.4
LFG10	2.98	0.0	0.2	18.7
LFG11	1.39	0.0	0.1	20.4
LFG12	2.99	0.0	0.1	20.1
LFG13	2.64	0.0	0.1	20.1
LFG14	3.18	0.0	0.1	20.3
LFG15	2.73	0.0	0.1	20.3
LFG16	3.24	0.0	0.2	20.1
LFG17	3.27	0.0	1.8	4.3
LFG18	4.63	0.0	0.2	20.1
LFG19	3.89	0.0	0.1	20.2
LFG20 [(a)]	N/A	N/A	N/A	N/A
LFG21	4.24	0.0	0.1	20.2
LFG22	4.12	0.0	0.1	20.3
LFG23	12.92	0.0	0.1	20.2
LFG24	6.52	0.0	0.1	20.2
GP1	Probe Bent	0.0	1.9	15.0
GP2 (shallow)	Probe Bent	0.0	0.8	19.2
GP2 (deep)	Probe Bent	0.0	0.1	20.1
GP3 (shallow)	Probe Bent	0.0	0.2	20.2
GP3 (deep)	Probe Bent	0.0	0.8	19.8
GP4 (shallow)	Probe Bent	0.0	0.6	19.7
GP4 (deep)	Probe Bent	0.0	0.5	19.8
GP5 (shallow)	Probe Bent	0.0	5.4	12.4
GP5 (deep)	43.25	0.0	0.2	20.0
GP6	41.53	0.0	0.7	18.1

Location	Water Level (mPD)	Methane (% (v/v))	Carbon Dioxide (% (v/v))	Oxygen (% (v/v))
GP7	36.93	0.0	0.2	19.8
GP12	2.71	0.0	1.3	17.7
GP15	3.01	0.0	0.1	20.2
P7	3.25	0.0	0.1	20.0
P8	3.24	0.0	0.1	20.2
P9	2.96	0.0	0.3	19.9

Note:

(a) The Monitoring well LFG20 was under maintenance.

TABLE G2.4 LANDFILL GAS MONITORING AT SERVICE VOIDS, UTILITIES PITS AND MANHOLE (APRIL 2024)

Location	Methane (% (v/v))	Carbon Dioxide (% (v/v))	Oxygen (% (v/v))
UU01	0.1	0.1	18.5
UU02	0.1	0.1	19.2
UU03	Voided due to latest site programme and on-going operation work		
UU04	0.1	0.1	19.6
UU05	0.1	0.1	19.8
UU06	0.1	0.0	19.9
UU07	0.1	0.1	19.6
UU08	0.1	0.0	19.6
UU09	0.1	0.0	19.7
UU10	0.1	0.0	19.6
UU11	0.1	0.0	19.4
UU12	Voided due to latest site programme and on-going operation work		
UU13	0.1	0.0	19.9
UU14	0.1	0.0	19.9
UU15	0.1	0.0	20.1
UU16	0.1	0.0	19.9
UU17	Voided due to latest site programme and on-going operation work		
UU18	Voided due to latest site programme and on-going operation work		
UU19	0.1	0.0	20.0
UU20	0.1	0.0	20.0
UU21	0.1	0.0	20.0
UU22	0.1	0.0	19.9
UU23	0.1	0.0	20.0
UU24	0.1	0.0	20.0
UU25	0.1	0.0	19.0
UU26	0.1	0.0	20.1
UU27	0.1	0.0	20.0
UU28	0.1	0.0	20.0

TABLE G2.5 LANDFILL GAS MONITORING AT SERVICE VOIDS, UTILITIES PITS AND MANHOLE (MAY 2024)

Location	Methane (% (v/v))	Carbon Dioxide (% (v/v))	Oxygen (% (v/v))
UU01	0.0	0.1	20.3
UU02	0.0	0.1	20.1
UU03	0.0	0.1	19.7
UU04	0.0	0.1	19.6
UU05	0.0	0.1	18.1
UU06	0.0	0.1	18.0
UU07	0.0	0.1	19.5
UU08	0.0	0.1	17.8
UU09	0.0	0.1	17.7
UU10	0.0	0.1	17.7
UU11	0.0	0.1	17.8
UU12	Voided due to latest site programme and on-going operation work		
UU13	0.0	0.1	17.8
UU14	0.0	0.1	17.8
UU15	0.0	0.1	17.8
UU16	0.0	0.1	18.1
UU17	Voided due to latest site programme and on-going operation work		
UU18	Voided due to latest site programme and on-going operation work		
UU19	Voided due to latest site programme and on-going operation work		
UU20	0.0	0.1	18.2
UU21	0.0	0.0	18.2
UU22	0.0	0.0	18.4
UU23	0.0	0.0	18.4
UU24	0.0	0.0	18.4
UU25	0.0	0.0	18.4
UU26	0.0	0.0	18.6
UU27	0.0	0.0	18.7
UU28	0.0	0.0	18.7

TABLE G2.6 LANDFILL GAS MONITORING AT SERVICE VOIDS, UTILITIES PITS AND MANHOLE (JUNE 2024)

Location	Methane (% (v/v))	Carbon Dioxide (% (v/v))	Oxygen (% (v/v))
UU01	0.0	0.1	20.0
UU02	0.0	0.1	20.0
UU03	Voided due to latest site programme and on-going operation work		
UU04	Voided due to latest site programme and on-going operation work		
UU05	Voided due to latest site programme and on-going operation work		
UU06	0.0	0.1	20.4
UU07	0.0	0.1	20.3
UU08	0.0	0.1	20.5
UU09	0.0	0.1	20.3
UU10	0.0	0.1	20.1
UU11	0.0	0.1	20.2
UU12	Voided due to latest site programme and on-going operation work		
UU13	0.0	0.1	20.5
UU14	0.0	0.1	20.1
UU15	0.0	0.1	20.1
UU16	0.0	0.1	20.5
UU17	Voided due to latest site programme and on-going operation work		
UU18	Voided due to latest site programme and on-going operation work		
UU19	Voided due to latest site programme and on-going operation work		
UU20	0.0	0.1	20.5
UU21	0.0	0.1	20.5
UU22	0.0	0.1	20.5
UU23	0.0	0.1	20.5
UU24	0.0	0.1	20.5
UU25	0.0	0.1	20.5
UU26	0.0	0.1	20.5
UU27	0.0	0.1	20.5
UU28	0.0	0.1	20.5

TABLE G2.7 LANDFILL GAS BULK GAS SAMPLING MONITORING RESULTS

Parameters	LFG2	LFG8
Methane (% (v/v))	<0.020	<0.020
Carbon Dioxide (% (v/v))	0.624	0.089
Oxygen (% (v/v))	17.2	20.4
Nitrogen (% (v/v))	79.5	76.9
Carbon Monoxide (% (v/v))	<0.020	<0.020
Hydrogen (% (v/v))	<0.020	<0.020
Ethane (ppmv)	<1.0	<1.0
Propane (ppmv)	<1.0	<1.0
Butane (ppmv)	<1.0	<1.0

TABLE G2.8 FLAMMABLE GAS SURFACE EMISSION MONITORING RESULTS

Time	GPS Coordinates Latitude (N)	Longitude (E)	Weather Condition	Temperature (°C)	Wind Direction (Deg)	Wind Speed (m/s)	Monitoring Results (ppm)
15:18	22°16'34"	114°16'38"	Sunny	28.8	095	1.5	13
15:43	22°16'24"	114°16'26"	Sunny	28.2	220	3.3	16
15:55	22°16'31"	114°16'27"	Sunny	28.4	192	4.0	11

ANNEX G3 EVENT AND ACTION PLAN FOR LANDFILL GAS MONITORING

ANNEX G3 EVENT AND ACTION PLAN FOR LANDFILL GAS MONITORING

Action			
Event	**ET**	**IEC**	**Contractor**
Limit Level being exceeded for field monitoring at the perimeter monitoring wells	• Investigate the cause(s) of exceedance • Prepare the Notification of Exceedance within 24 hours • Check monitoring data, all plant, equipment and the Contractor's working methods • Inform Contractor, IEC, Project Proponent and EPD (EIAO Authority) whether the cause of exceedance is due to the Project • Discuss with Contractor and IEC for remedial measures required • Ensure remedial measures are properly implemented • Increase the monitoring frequency to daily if exceedance is due to the Project for monitoring wells in the areas where there is development within 250m of the SENTX Site Boundary and to weekly for other monitoring wells, until no exceedance of limit level	• Verify the Notification of Exceedance • Discuss with ET and Contractor on proposed remedial measures • Review proposals on remedial measures • Audit the implementation of the remedial measures • Audit the effectiveness of the implemented remedial measures	• Repeat field measurement to confirm findings • Check the performance of landfill gas management system • Rectify unacceptable practice • Discuss with the ET and IEC and submit proposals for remedial measures to IEC • Implement the agreed proposals • Amend proposal if appropriate
Limit Level being exceeded for the bulk gas sampling at the perimeter monitoring wells	• Check and compare the results of field monitoring and laboratory analyse of bulk samples • If the results of field monitoring also show exceedance, the action(s) for limit level being exceeded for field monitoring would have been triggered • If the results of field monitoring does not show exceedance, the sampling	• Verify the findings by ET	• Nil

Action			
Event	**ET**	**IEC**	**Contractor**
	procedures should be checked and if deems necessary, to repeat the monitoring and recalibrate the portable monitoring instruments • Notify the above findings to Contractor and IEC		
Limit Level being exceeded at the permanent gas monitoring system	• Investigate the cause(s) of exceedance • Prepare the Notification of Exceedance within 24 hours • Check the methane gas level at the perimeter monitoring wells, manholes or utilities duct • Check monitoring data, all plant, equipment and the Contractor's working methods • Inform Contractor, IEC, Project Proponent and EPD (EIAO Authority) whether the cause of exceedance is due to the Project • Discuss with Contractor and IEC for remedial measures required • Ensure remedial measures are properly implemented	• Verify the Notification of Exceedance • Discuss with ET and Contractor on proposed remedial measures • Review proposals on remedial measures • Audit the implementation of the remedial measures Audit the effectiveness of the implemented remedial measures	• Evacuate all staff in the concerned building • Open the doors and window of all rooms on the ground floor • Do not allow staff to go back to the room if methane level is higher than 1% gas • Check the performance of the landfill gas management system • Rectify unacceptable practice • Consider changes of working methods • Discuss with the ET and IEC and submit proposals for remedial measures to IEC • Implement the agreed proposals • Amend proposal if appropriate
Limit Level being exceeded during surface emission monitoring	• Repeat the measurement to confirm findings • Investigate the cause(s) of exceedance • Prepare the Notification of Exceedance within 24 hours • Check monitoring data, all plant, equipment and the Contractor's working methods	• Verify the Notification of Exceedance • Discuss with ET and Contractor on proposed remedial measures • Review proposals on remedial measures • Audit the implementation of the remedial measures • Audit the effectiveness of the implemented remedial measures	• Check landfill gas management system • Rectify unacceptable practice • Consider changes of working methods • Discuss with the ET and IEC and submit proposals for remedial measures to IEC • Implement the agreed proposals • Amend proposal if appropriate

Action			
Event	**ET**	**IEC**	**Contractor**
	• Inform Contractor, IEC, Project Proponent and EPD (EIAO Authority) whether the cause of exceedance is due to the Project • Discuss with Contractor and IEC for remedial measures required • Ensure remedial measures are properly implemented • Increase the monitoring frequency to monthly if exceedance is due to the Project until no exceedance of limit level		
Limit Level being exceeded at the service voids, utilities pits, manholes and location of vegetation stress	• Repeat the measurement to confirm findings • Investigate the cause(s) of exceedance • Prepare the Notification of Exceedance within 24 hours • Check monitoring data, all plant, equipment and the Contractor's working methods • Inform Contractor, IEC, Project Proponent and EPD (EIAO Authority) whether the cause of exceedance is due to the Project • Discuss with Contractor and IEC for remedial measures required • Ensure remedial measures are properly implemented • Increase the monitoring frequency to weekly if exceedance is due to the Project until no exceedance of limit level	• Verify the Notification of Exceedance • Discuss with ET and Contractor on proposed remedial measures • Review proposals on remedial measures • Audit the implementation of the remedial measures • the effectiveness of the implemented remedial measures	• Check landfill gas management system • Rectify unacceptable practice • Discuss with the ET and IEC and submit proposals for remedial measures to IEC • Implement the agreed proposals • Amend proposal if appropriate

ANNEX H

CUMULATIVE STATISTICS ON EXCEEDANCES, ENVIRONMENTAL COMPLAINTS, NOTIFICATION OF SUMMONS AND STATUS OF PROSECUTION

TABLE H1 CUMULATIVE STATISTICS ON EXCEEDANCES

		Total No. recorded in this reporting period	Total No. recorded since project commencement
Air Quality (Dust)	Action	0	0
	Limit	0	21
Air Quality (Odour)	Action	0	0
	Limit	0	0
Air Quality (Emissions of Thermal Oxidiser)	Limit	0	4
Air Quality (Emissions of Landfill Gas Flare)	Limit	3	8
Air Quality (Emissions of Landfill Gas Generator)	Limit	0	0
Noise	Action	0	0
	Limit	0	0
Water Quality (Surface Water)	Limit	3	0
Water Quality (Leachate)	Limit	0	64
Water Quality (Leachate Level)	Limit	0	1
Water Quality (Groundwater)	Limit	5	194
Landfill Gas (Perimeter Landfill Gas Monitoring Wells)	Limit	0	28
Landfill Gas (Service Void, Utilities and Manholes)	Limit	0	4
Landfill Gas (Permanent Gas Monitoring System)	Limit	0	0

TABLE H2 CUMULATIVE STATISTICS ON COMPLAINTS, NOTIFICATIONS OF SUMMONS AND SUCCESSFUL PROSECUTIONS

Reporting Period	Cumulative Statistics		
	Complaints	Notifications of Summons	Prosecutions
This Reporting Period (1 Apr – 30 Jun 2024)	0	0	0
Total no. received since project commencement	1	0	0

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ERM's Hong Kong Office
2509, 25/F One Harbourfront
Hunghom, Kowloon
Hong Kong

T: (852) 2271 3000
F: (852) 3015 8052

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