

WHINNEY HILL LANDFILL SITE**PHASE 2****MONITORING MANAGEMENT PLAN**

April 2021

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| Site | Whinney Hill Landfill – Phase 2 |
| Document Title | WNHP2/07 - Monitoring Management Plan April 2021 |
| Location of controlled copy | 1. Environment Department Folder 2. Environmental Permit Folder |

| Date | Description and Summary of Changes |
|----------------------|---|
| November 2005 | Original Document. Changes Not Applicable |
| August 2008 | Amend borehole references and requirements to correspond with permit variation WP3439LR issued 23 August 2007. |
| November 2012 | Updated format and references to SITA Policies and Procedures. Incorporated various changes that had been agreed outside of revising the MMP previously. Revised in preparation for permit variation application. |
| February 2013 | Updated leachate level compliance limits |
| April 2013 | Updated permit references, updated leachate level compliance limits and the addition of leachate assessment levels. |
| June 2013 | Updated to reflect issue of permit variation. |
| Dec 2013 | Updated to reflect replacement of WH/LM4/3 with WH/LM4/3R |
| July 2015 | Updated to reflect issue of permit variation, mainly: Reduction of Gas, Leachate Analysis and Groundwater monitoring to Quarterly. Trigger Level changes for Leachates. Also revised to match new template. |
| April 2016 | Amendment to include leachate well re-drill WH/LM4/4R. Change to Suez format. |
| October 2016 | Removal of perimeter gas monitoring points EN/BH3/5 and EN/BH13/5 |
| August 2017 | Inclusion of leachate compliance limits and monitoring requirements for Cell 8/2 (LMP8B, LM8/3 and LM8/4) following EA agreement. Monitoring plan updated, including new location of SW5. |
| April 2020 | Updated with new cell Monitoring Points LMP6A, LM6/1 and LM6/2. Updated MMP format and quarterly report requirements in line with S4.1 of the permit. Updated contingency actions with new role titles. |
| April 2021 | Updated MMP to support permit variation application, the following amendments are proposed: <ul style="list-style-type: none"> • Increase in leachate level compliance limits • addition of further flare and contingency gas engine • groundwater quality monitoring programme • replacement of perimeter gas carbon dioxide limits with action levels • replacement of some surface water compliance limits with action levels |

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Figure 1. Monitoring Location Plan

1.0 INTRODUCTION

- 1.1 This Monitoring Management Plan (MMP) for Whinney Hill, Phase 2 Landfill (the Site) has been produced in line with the Permit, local agreements and approved documents.
- 1.2 The Environmental Monitoring regime is detailed in Section 2. Compliance Limits, Assessment Limits and Action Levels are detailed in Section 3. Contingency Actions to be implemented if a compliance limit, assessment level or action level is breached are detailed in Section 4. Locations of monitoring points are shown in Figure 1.
- 1.3 An inspection to determine that all monitoring infrastructure is in a fit for purpose condition is conducted during every scheduled monitoring site visit. The results are recorded within Suez's internal electronic systems and where necessary, remediation plans are implemented.
- 1.4 SUEZ has internal procedures for the monitoring and sampling of landfill gases, surface waters, groundwater and leachate. These protocols will be adhered to in monitoring at the site:
 - i. Procedure to measure methane, carbon dioxide and oxygen in and around landfill sites SUEZ-G01
 - ii. Procedure to measure groundwater and leachate levels SUEZ-L01
 - iii. Procedure to sample raw waters and leachate SUEZ-S01Copies are available upon request.
- 1.5 Suez are certified to ISO 14001 and ISO 9001 and OHSAS 18001 standards.
- 1.6 A suitable UKAS accredited laboratory will carry out all aqueous sample analysis. Approved suppliers will be used for any other analysis requirements.
- 1.7 All monitoring data and sampling results are stored electronically on a Suez monitoring database, which is backed up daily and stored for a minimum period of 6 years.
- 1.8 Quarterly monitoring data submissions will be made through the Agency's sharefile link system as per the table below. Quarterly submissions will include data for groundwater level and quality, leachate level, surface water quality and flow, leachate discharge flow, perimeter gas and in-waste gas in accordance with Table S4.1 of the Permit.
- 1.9 An annual monitoring report will be submitted to the Environment Agency on an annual basis by 31 March each year, covering a reporting period of 1 January to 31 December and will include all environmental monitoring data collected during the reporting period.
- 1.10 Reporting and monitoring periods:

| Description of Task | Monitoring Period | Reporting Period | Report Deadline | Submission |
|--|--------------------|--------------------|-----------------|------------|
| Annual Interpretive Report (4.2.2a) and Monitoring Requirements. | 1 Jan to 31 Dec | 1 Jan to 31 Dec | 31 March | |
| Quarterly Monitoring and Reporting | 1 Jan to 31 March | 1 Jan to 31 March | 28 April | |
| | 1 April to 30 June | 1 April to 30 June | 28 July | |
| | 1 July to 30 Sept | 1 July to 30 Sept | 28 October | |
| | 1 Oct to 31 Dec | 1 Oct to 31 Dec | 28 January | |

Note: Monitoring periods, reporting periods and report submission deadline dates may be altered upon receipt of written agreement from the Environment Agency.

Note: Multiyear analytical monitoring requirements will be scheduled and reported as required by the MMP.

2.0 MONITORING REGIME

| Surface Water | | |
|--|---------------|--|
| Monitoring Points | Frequency | Determinands |
| WH/SW1, WH/SW2, WH/SW3, WHSW3A, WH/SW4, WH/SW5 | Instantaneous | flow |
| <i>SW3A to be monitored until SW3 constructed.</i> | Monthly | pH, electrical conductivity, ammoniacal nitrogen, chloride, suspended solids, visual oil and grease, temperature |
| WH/SW1, WH/SW2, WH/SW3, WHSW3A, WH/SW4, WH/SW5 | Annually | As monthly plus: sulphate, alkalinity, TON, TOC, sodium, potassium, calcium, magnesium, iron, manganese, cadmium, chromium, copper, nickel, lead, zinc, mecoprop, phenol |
| <i>SW3A to be monitored until SW3 constructed.</i> | | |

| Groundwater | | |
|--|---------------|---|
| Monitoring Points | Frequency | Determinands |
| Up gradient boreholes: WHBH0203OLR, EQ/BHC2(R), WHBH15AM, WH/0419AM, WH/0421AM, EQ/BHC1(R), WHBH15DKF, WHBH209DKFR, WHBH35, WH/420DKF, WH/0422DKF, WH/0202DKF(R), WHBH206DKF | Quarterly | Groundwater level, pH, electrical conductivity, ammoniacal nitrogen, chloride |
| | Annually | As quarterly plus: calcium, magnesium, sodium, potassium, alkalinity, sulphate, iron, manganese, chromium, copper, lead, zinc, base of monitoring point, mecoprop, nickel, toluene |
| Down Gradient boreholes: WH/0401DKF1, WH/0203AM(R), WH/0203DKF(R), WH/BH87DKF, WH/BH87OLR, WH/BH88DKF, WH/BH88OLR, WH/BH89DKF, WH/BH89AM, WH/BH89OLR, EQ/BHA1(R)1, EQ/BHA2(R)1, | Every 2 years | As quarterly and annual plus: volatile organic compounds, semi volatile organic compounds, organotin compounds, organochlorine and organophosphorus pesticides, acid herbicides and speciated TPH. Other substances as agreed with the SUEZ risk team |

| Gas External | | |
|--|-----------|---|
| Monitoring Points | Frequency | Determinands |
| EN/BH1, EN/BH2/1, EN/BH2/2, EN/BH2/3, EN/BH2/4, EN/BH3/1, EN/BH3/2, EN/BH3/3, EN/BH3/4, EN/BH5, EN/BH6/1, EN/BH6/2, EN/BH6/3, EN/BH6/4, EN/BH7/1, EN/BH7/2, EN/BH7/3, EN/BH7/4, EN/BH8, EN/BH9/1, EN/BH9/2, EN/BH9/3, EN/BH9/4, EN/BH10/1, EN/BH10/2, EN/BH10/3, EN/BH10/4, EN/BH11/1, EN/BH11/2, EN/BH11/3, EN/BH11/4, EN/BH12/1, EN/BH12/2, EN/BH12/3, EN/BH12/4, EN/BH13/1, EN/BH13/2, EN/BH13/3, EN/BH13/4, EN/BH14/1, EN/BH14/2, EN/BH14/3, EN/BH14/4, EN/BH15/1, EN/BH15/2, EN/BH15/3, EN/BH15/4, EN/BH16/1, EN/BH16/2, EN/BH16/3, EN/BH16/4, WH/BH65, WH/BH66, WH/BH67, WH/BH68A, WH/BH68B, WH/BH69, WH/BH70, WH/BH71, WH/BH72, WH/BH73, WH/BH74, WH/BH75 | Quarterly | Methane, carbon dioxide, oxygen, atmospheric pressure, meteorological data. Record whether the ground is: Waterlogged / Frozen / Snow covered |

| Gas Internal | | |
|---|-----------|--|
| Monitoring Points | Frequency | Determinands |
| Gas collection system at control valve and/or manifolds on gas system | Monthly | Methane, carbon dioxide, oxygen, carbon monoxide, atmospheric pressure, gas flow rate or suction, % Balance Gas (calculated as the difference between the sum of measured gases and 100%). Record whether the ground is: Waterlogged / Frozen / Snow covered |
| | 6 Monthly | Hydrogen Sulphide |
| Input to Gas Utilisation Compound | Annually | Trace gas analysis in accordance with LFTGN04 (v3 2010) or as otherwise agreed with EA. |
| Input to Gas Utilisation Compound | Weekly | Methane, carbon dioxide, oxygen, gas flow rate, Suction, % Balance Gas (calculated as the difference between the sum of measured gases and 100%) |
| Engine A1, A2, A3, A4, A5, A6 + A8 (back-up flare) | Annually | Oxides of Nitrogen, CO, Total VOC's |
| | Quarterly | NOx and CO |
| Flares A7 + A9 | Annually | Oxides of Nitrogen, CO Total VOC's. Temperature (in accordance with LFTGN05 (v2 2010) or as otherwise agreed with EA). |

Annual flare monitoring only required if the flare operates for more than 10% of a year (876 hours).

| Surface Emissions – FID Walkover | |
|--|-----------------------------|
| Monitoring Points | Frequency |
| Permanently and Temporarily capped zone and Uncapped areas | Annually |
| Permanently capped zone and Temporarily capped zone | In accordance with LFTGN07* |

*: LFTGN07 states monitoring of emissions through a landfill cap has two stages:

1. Initially a walkover survey using an FID demonstrates whether there are inadequacies in the gas containment and collection system. Only when these deficiencies have been located and remedied such that the concentration of gas above the surface is low is it appropriate to begin a quantitative survey of surface flux.

2. Subsequently, the flux of methane emitted through the intact cap is measured at a number of representative points using an array of flux boxes. From these individual measurements, we can calculate the average flux from capped zones. This identified where the gas flux exceeds an emission standard set by the Environment Agency.

Progression to Stage (2) will not occur until Stage (1) demonstrates results are less than the assessment limits in Section 3. Where the assessment limits in Section 3 are exceeded, the Landfill Gas Surface Emissions Contingency Action (Section 4) will be implemented.

Where the flux box survey shows results below the compliance limits detailed in Section 3 and there have been no significant physical changes in the gas management during the year, a detailed annual FID walkover survey (Stage i) can be used to demonstrate that the surface emissions are compliant, by comparing results to the assessment limits detailed in Section 3.

If the surveys show no change in the pattern of methane emissions, the values for the flux and total methane emissions measured in the initial survey may be reported and a fresh flux box survey is not necessary.

| Leachate | | |
|---|--|---|
| Monitoring Points | Frequency | Determinands |
| WH/LM4/3R, WH/LM4/4R, WH/LM5/1, WH/LM5/2, WH/LM5/3, WH/LM5/4, WH/LM6/1, WH/LMP6A, WH/LM7/1, WH/LM7/2, WH/LM7/3, WH/LM7/4, WH/LM7/5, WH/LM7/6, WH/LM8/1, WH/LM8/2, WH/LM8/3, WH/LM8/4 <i>WH/LM6/3 and WH/LM6/4 to be monitored when constructed</i> | Monthly or Quarterly (if cell is permanently capped) | Depth to leachate |
| WH/LM4/3R, WH/LM4/4R, WH/LM5/1, WH/LM5/2, WH/LM5/3, WH/LM5/4, WH/LM6/1, WH/LM7/1, WH/LM7/2, WH/LM7/3, WH/LM7/4, WH/LM7/5, WH/LM7/6, WH/LM8/1, WH/LM8/2, WH/LM8/3, WH/LM8/4, WH/LMP4.1, WH/LMP5B, WH/LMP7B <i>WH/LM6/3, WH/LM6/4, WH/LMP6B to be monitored when constructed</i> | Annually | Base elevation of monitoring point |
| WH/LMP4.1, WH/LMP5B, WH/LMP6B, WH/LMP7B, WH/LMP8A, WH/LMP8B <i>WH/LMP6B to be monitored when constructed</i> | Quarterly | pH, electrical conductivity, ammoniacal nitrogen, chloride, BOD, COD, calcium, magnesium, sodium, potassium, iron, manganese, chromium, copper, nickel, lead, zinc, cadmium, arsenic, total sulphates, alkalinity, temperature |
| | Annually or Every 4 years (if cell is permanently capped) | As quarterly plus: mercury, phenol, volatile organic compounds, semi volatile organic compounds, organotin compounds, organochlorine and organophosphorus pesticides, acid herbicides, mecoprop and speciated TPH. Other substances as agreed with the SUEZ risk team |

Note: WH/LMP7A, WH/LMP7B, WH/LM7/1, WH/LM7/2, WH/LM7/3, WH/LM7/4 and WH/LM4/4R were previously called WH/7.1LEC, WH/7.2LEC, WH/7.1LMP1, WH/7.1LMP2, WH/7.2LMP1, WH/7.2LMP2 and WH/LM4/4 respectively.

| Discharge Consent | | |
|-------------------|-----------|---|
| Monitoring Points | Frequency | Determinands |
| WH/D1 | Daily | Daily maximum flow Daily maximum volume |
| | Monthly | ammoniacal nitrogen, antimony, arsenic, beryllium, BOD, cadmium, chloride, chromium, COD, copper, cyanide, formaldehyde, lead, mercury, nickel, NVM (Petroleum Spirit Extractable), pH, selenium, settleable solids, silver, sulphate, sulphides, sulphur, temperature, tin, total suspended solids, vanadium, zinc and ammonia, separable grease and oil, dissolved methane, calcium carbide, carbon disulphide, organo-halogens |

WH/D1 analysis requirements are included as the monitoring is required to demonstrate compliance with the trade effluent consent issued by United Utilities.

3.0 COMPLIANCE / ASSESSMENT LIMITS

| Landfill Gas Compliance Limits and Action Levels | | | | | |
|--|--------------------------------|-----------------------------------|------------------|--------------------------------|-----------------------------------|
| Monitoring Point | Methane Compliance Limits %v/v | Carbon Dioxide Action Levels %v/v | Monitoring Point | Methane Compliance Limits %v/v | Carbon Dioxide Action Levels %v/v |
| WH/BH65 | 1.0 | 5.6 | EN/BH14/4 | 1.1 | 1.5 |
| WH/BH66 | 1.0 | 1.7 | EN/BH15/1 | 1.1 | 1.2 |
| WH/BH67 | 1.0 | 8.0 | EN/BH15/2 | 1.1 | 1.3 |
| WH/BH68A | 1.0 | 2.1 | EN/BH15/3 | 1.1 | 2.9 |
| WH/BH68B | 1.0 | 2.1 | EN/BH15/4 | 1.1 | 4.1 |
| WH/BH69 | 1.0 | 7.1 | EN/BH16/1 | 1.1 | 3.9 |
| WH/BH70 | 1.0 | 3.9 | EN/BH16/2 | 1.1 | 3.7 |
| WH/BH71 | 1.0 | 7.1 | EN/BH16/3 | 1.1 | 3.7 |
| WH/BH72 | 1.0 | 9.8 | EN/BH16/4 | 1.1 | 3.5 |
| WH/BH73 | 1.0 | 7.0 | EN/BH2/1 | 1.1 | 2.1 |
| WH/BH74 | 1.0 | 5.3 | EN/BH2/2 | 1.1 | 2.1 |
| WH/BH75 | 1.0 | 11.5 | EN/BH2/3 | 1.1 | 4.6 |
| EN/BH1 | 1.1 | 3.2 | EN/BH2/4 | 1.1 | 3.0 |
| EN/BH10/1 | 1.1 | 3.8 | EN/BH3/1 | 1.1 | 3.6 |
| EN/BH10/2 | 1.1 | 4.4 | EN/BH3/2 | 1.1 | 8.7 |
| EN/BH10/3 | 1.1 | 5.1 | EN/BH3/3 | 1.1 | 10.9 |
| EN/BH10/4 | 1.1 | 7.3 | EN/BH3/4 | 1.1 | 4.6 |
| EN/BH11/1 | 1.1 | 7.5 | EN/BH5 | 1.1 | 4.7 |
| EN/BH11/2 | 1.1 | 5.5 | EN/BH6/1 | 1.1 | 3.6 |
| EN/BH11/3 | 1.1 | 5.2 | EN/BH6/2 | 1.1 | 3.5 |
| EN/BH11/4 | 1.1 | 5.6 | EN/BH6/3 | 1.1 | 5.8 |
| EN/BH12/1 | 1.1 | 5.7 | EN/BH6/4 | 1.1 | 8.3 |
| EN/BH12/2 | 1.1 | 4.0 | EN/BH7/1 | 1.1 | 8.3 |
| EN/BH12/3 | 1.1 | 4.7 | EN/BH7/2 | 1.1 | 5.4 |
| EN/BH12/4 | 1.1 | 4.0 | EN/BH7/3 | 1.1 | 5.0 |
| EN/BH13/1 | 1.1 | 3.2 | EN/BH7/4 | 1.1 | 7.8 |
| EN/BH13/2 | 1.1 | 2.7 | EN/BH8 | 1.1 | 4.2 |
| EN/BH13/3 | 1.1 | 2.8 | EN/BH9/1 | 1.1 | 5.3 |
| EN/BH13/4 | 1.1 | 3.7 | EN/BH9/2 | 1.1 | 3.7 |
| EN/BH14/1 | 1.1 | 5.0 | EN/BH9/3 | 1.1 | 4.0 |
| EN/BH14/2 | 1.1 | 1.2 | EN/BH9/4 | 1.1 | 5.3 |
| EN/BH14/3 | 1.1 | 1.7 | | | |

| Landfill Gas Collection System Assessment Limits | |
|---|--|
| Monitoring Point | Assessment Limit |
| Gas collection system at well control valve and/or manifold on gas system | Where the oxygen level exceeds 5% or the % balance gas is greater than 20% an assessment of air ingress into the system shall be undertaken. |
| | Where the concentration of carbon monoxide exceeds 100ppm. |
| | Concentrations of hydrogen sulphide shall be assessed in accordance with the gas and odour management plans |
| Input to LFG Utilisation Compound | Where the oxygen level exceeds 5% or the % balance gas is greater than 20% an assessment of air ingress into the system shall be undertaken. |
| | The concentration of trace gas components shall be assessed against the assumptions made in the Landfill Gas Risk Assessment and Dispersion Modelling. |

| Gas Emissions- Flare Compliance Limits | | |
|--|-----------|----------------------------------|
| Determinand | Frequency | Emission Limit mg/m ³ |
| NOx | Annually | 150 |
| CO | | 50 |
| Total VOCs | | 10 |

Note: For flare commissioned post Dec 2003

| Gas Emissions- Engine Compliance Limits | | |
|---|-----------|----------------------------------|
| Determinand | Frequency | Emission Limit mg/m ³ |
| NOx | Annually | 500 |
| CO | | 1400 |
| Total VOCs | | 1000 |

Note: Lower engine emission standard applied to all engines following updated Atmospheric Dispersion Modelling (Golder Associates, October 2012).

| Surface Emission Assessment Limits | |
|---|-------------------------|
| Zone | Assessment Limit (ppmv) |
| Immediately above the surface on main zones of the cap and temporary cap | 100 |
| Close to any discrete feature such as a leachate well or well head or above uncapped area | 1000 |

Note: Assessment limits assigned in-line with those recommended within Environment Agency guidance LFTGN07 V2 (2010)

| Flux Emission Assessment Limits | |
|---------------------------------|---|
| Zone | Assessment Limit (mg/m ² /sec) |
| Permanently capped zone | 0.001 |
| Temporarily capped zone | 0.1 |

Note: Assessment limits assigned in-line with those recommended within Environment Agency guidance LFTGN07 V2 (2010)

| Leachate Compliance and Assessment Limits | | | |
|---|------------------|-----------------------|-------------------------|
| Cell | Monitoring Point | Action Level (mAOD) | Compliance Limit (mAOD) |
| Cell 4/1 | LM4/3R | 141.50 | 142.00 |
| Cell 4/2 | LM4/4R | 146.50 | 147.00 |
| Cell 5/1 | LM5/1 | 147.00 | 147.50 |
| | LM5/2 | 147.00 | 147.50 |
| Cell 5/2 | LM5/3 | 144.50 | 145.00 |
| | LM5/4 | 144.50 | 145.00 |
| Cell 6/1* | LMP6/A | 143.10 | 143.60 |
| | LM6/1 | 144.38 | 144.88 |
| Cell 7/1 | LM7/1 | 140.50 | 141.00 |
| | LM7/2 | 140.50 | 141.00 |
| Cell 7/2 | LM7/3 | 140.50 | 141.00 |
| | LM7/4 | 140.50 | 141.00 |
| Cell 7/3 | LM7/5 | 142.50 | 143.00 |
| | LM7/6 | 142.50 | 143.00 |
| Cell 8/1 | LM8/1 | 142.50 | 143.00 |
| | LM8/2 | 142.50 | 143.00 |
| Cell 8/2 | LM8/3 | 136.50 | 137.00 |
| | LM8/4 | 136.50 | 137.00 |
| Cell 6/2 | LM6/3 | Not Constructed - TBC | |
| | LM6/4 | Not Constructed - TBC | |

* Note: Leachate compliance elevation to be revised on completion of Cell 6/2

| Discharge to Sewer Compliance Limit | | |
|-------------------------------------|-----------|--------------------------|
| Monitoring Point | Parameter | Limit |
| WH/D1 | Volume | 1000 m ³ /day |

| Surface Water Compliance Limits | | |
|---------------------------------|----------------------------|-------|
| Monitoring Point | Parameter | Limit |
| WH/SW3a | pH | >5 <9 |
| | Ammoniacal nitrogen (mg/l) | 1.0 |
| | Suspended Solids (mg/l) | 30 |
| | Flow (l/sec) | 10 |
| WH/SW3* | Ammoniacal nitrogen (mg/l) | 0.5 |
| | Chloride (mg/l) | 250 |
| | Suspended Solids (mg/l) | 30 |
| | Flow (l/sec) | 10 |
| WH/SW4 | Ammoniacal nitrogen (mg/l) | 1.0 |
| | Chloride (mg/l) | 250 |
| | Suspended Solids (mg/l) | 59.4 |
| | Flow (l/sec) | 10 |
| WH/SW5 | Ammoniacal nitrogen (mg/l) | 1.0 |
| | Chloride (mg/l) | 250 |
| | Suspended Solids (mg/l) | 30 |
| | Flow (l/sec) | 30 |

* Note: To be installed following agreement of Surface Water Management Plan

| Surface Water Action Levels | | |
|-----------------------------|-----------------|-------|
| Monitoring Point | Parameter | Limit |
| WH/SW3* and SW4 | Mecoprop (µg/l) | 18 |
| | Cadmium (mg/l) | 0.001 |
| | Nickel (mg/l) | 0.02 |

| Groundwater Compliance Limits and Action Levels | | | |
|---|---------------------|---------------------|-------------------------|
| Monitoring Point | Parameter | Action Level (mg/l) | Compliance limit (mg/l) |
| WH/BH87OLR, WH/BH88OLR, WH/BH89OLR | Ammoniacal nitrogen | 2 | 4 |
| | Chloride | 150 | 250 |
| | Mecoprop | 0.0003 | 0.0006 |
| | Nickel | 0.01 | 0.02 |
| | Toluene | None as haz | 0.004 |
| WH/BH89AM, WH/0203AMR and, EQBHA2R | Ammoniacal nitrogen | 0.5 | 1.62 |
| | Chloride | 150 | 320 |
| | Mecoprop | 0.0003 | 0.0017 |
| | Nickel | 0.01 | 0.02 |
| | Toluene | None as haz | 0.004 |
| WH/BH87DKF, WH/BH88DKF, WH/BH89DKF, WH/0203DKFR and WH/0401DKF, EQBHA1R | Ammoniacal nitrogen | 2 | 3.57 |
| | Chloride | 150 | 250 |
| | Mecoprop | 0.0003 | 0.0022 |
| | Nickel | 0.01 | 0.02 |
| | Toluene | None as haz | 0.004 |

4.0 CONTINGENCY ACTIONS

| Landfill Gas Flare / Engine | | |
|---|-----------------------------------|--|
| Contingency Action | Response Time | Responsibility |
| Notify the EA and Operations Manager via the notification form as required by condition 4.3.2 of the Permit | 24 hours | Operations Manager / EIR Manager / EIR Advisor |
| Raise a CAR on Compas to ensure appropriate contingency actions are undertaken. | 48 hours | Operations Manager / EIR Manager / EIR Advisor |
| Verify results with the gas analyst | 7 days | Operations Manager / EIR Manager / EIR Advisor |
| Re-test | 1 month | Operations Manager / EIR Manager / EIR Advisor |
| Action plan to be agreed following retest, action plan to include: determine risk. If risks unacceptable remedial actions to be implemented | 3 months or as agreed with the EA | Operations Manager / EIR Manager / EIR Advisor |

| Perimeter Gas Compliance Limits | | | |
|---------------------------------|--|--|-------------------------|
| Scenario | Contingency Action | | Response Time |
| Initial Result | Internally Record and inform Operations Manager | | Up to 24 Hours |
| | Hazard Potential (calculated as) $\leq Low$ | Record internally <u>End of Actions</u> | 24 Hours |
| | Hazard Potential (calculated as) $\geq Moderate$ | Inform the Environment Agency | 24 Hours |
| | | Confirm calibration and QA procedures for equipment used | 48 Hours |
| | | Inform Operations Manager to initiate measures to control migration in accordance with the Gas Management Plan | 48 Hours |
| | | Complete repeat monitoring visit | 1 Month |
| Re-Sample (Compliant) | <u>End of Actions</u> | | |
| Re-Sample (Non-Compliant) | Hazard Potential (calculated as) $\leq Low$ | Inform the Operations Manager and record internally <u>End of Actions</u> | 24 Hours post re-sample |

| Perimeter Gas Compliance Limits | | | |
|---|--|--|--------------------------|
| Scenario | Contingency Action | | Response Time |
| | Hazard Potential (calculated as) \geq Moderate | Maintain monthly monitoring frequency until concentration declines below the Compliance Limit or if concentration does not decline for a period of 3 months maintain monitoring until the concentration is shown to be stable. | 1 Month |
| | | Review gas infrastructure (if applicable) and notify the Environment Agency. | Up to 3 Months |
| An increasing trend (above compliance limits) is identified | Produce a Gas Action Plan (if necessary) and submit to the EA. | | To be agreed with the EA |

| Perimeter Gas Action Level | | | |
|--|------------------------------------|--|--------------------------|
| Scenario | Contingency Action | | Response Time |
| Initial Result | Hazard Potential ≤Low | Inform the Operations Manager. Record internally <u>End of Actions</u> | 24 Hours |
| | Hazard Potential ≥ <i>Moderate</i> | Inform Operations Manager to initiate measures to control migration. Record internally | 48 Hours |
| | | Confirm calibration and QA procedures for equipment used | 48 Hours |
| | | Review actions and data trends during monthly compliance meeting | 1 Month |
| In the event of persistent Action Level breaches or rising trends: Produce a Gas Action Plan and submit to the EA | | | To be agreed with the EA |

| Landfill Gas Collection System | | |
|--|--|--------------------|
| Contingency Action | Response Time | Responsibility |
| Where the oxygen level exceeds 5% or where the addition of carbon dioxide and methane percentages is less than 80% | An assessment of air ingress into the system shall be undertaken | Operations Manager |
| Where the concentration of carbon monoxide exceeds 100ppm. | Further investigation shall be undertaken | Operations Manager |

| Landfill Gas Surface Emissions - Walkover | | |
|--|---|--|
| Contingency Action | Response Time | Responsibility |
| Inform Operations Manager | 24 hours | Aftercare Technician / Aftercare Operative |
| Raise a CAR on Compas to ensure appropriate contingency actions are undertaken. | 48 hours | Aftercare Technician / Aftercare Operative |
| Agree and implement remedial actions | 1 month | Aftercare Technician / Aftercare Operative |
| Re-monitor the area of exceedance and adjacent installations to confirm remedial actions were successful | 2 months | Aftercare Technician / Aftercare Operative |
| Report results to the EA | Contained within annual report for period monitored | Aftercare Technician / Aftercare Operative |

| Landfill Gas Surface Emissions – Flux Box | | |
|---|---------------|--|
| Contingency Action | Response Time | Responsibility |
| Inform Operations Manager & notify the EA via Schedule 5 Notification | 24 hours | Aftercare Technician / Aftercare Operative / EIR Manager / EIR Advisor |
| Raise a CAR on Compas to ensure appropriate remedial actions are undertaken. | 48 hours | Aftercare Technician / Aftercare Operative / EIR Manager / EIR Advisor |
| Agree and implement remedial actions | 1 month | Operations Manager / EIR Manager / EIR Advisor |
| Re-monitor the area using an appropriate survey | 3 months | Aftercare Technician / Aftercare Operative |
| Undertaken a further flux box survey one year from the data of the initial survey | 12 months | Operations Manager / Aftercare Technician / Aftercare Operative |

| Leachate Level – Compliance Limit | | |
|---|---------------|--|
| Contingency Action | Response Time | Responsibility |
| Notify Operations Manager / Technical Team / EIR Team | 24 hours | Aftercare Technician/Aftercare Operative |
| Review existing management systems monitoring information including leachate head changes, pumping volumes, system performance and associated works on site | 4 days | Technical Team/Site Management Team |
| Notify the EA via the notification form as required by condition 4.3.2 of the Permit | 5 days | Aftercare Technician/Aftercare Operative |
| Review site management and operations and implement actions to address any future exceedance of a management level. | 7 days | Technical Team/Site Management Team |
| Review the assumptions incorporated into the site water balance/leachate production rates/leachate extraction rates | 7 days | Technical Team/Site Management Team |
| Identify timescale for reduction of head(s) to maintain leachate elevations at or below Action Levels. | 7 days | Technical Team/Site Management Team |
| Update Environment Agency of findings via a Schedule 5 Notification Part B Form | 14 days | EIR Team |
| Review (as required) the existing LMP, HRA Review, action and compliance levels with regards to change in risks and timescales for management of elevated leachate heads. If risks are unacceptable set in place procedures for implementing corrective measures in consultation with the Environment Agency. | 3 months | Technical Team/Site Management Team |

| Leachate Level – Action Level | | |
|---|---------------|--|
| Contingency Action | Response Time | Responsibility |
| Notify Operations Manager / Technical Team / EIR Team | 24 hours | Aftercare Technician/Aftercare Operative |
| Review existing management systems monitoring information including leachate head changes, pumping volumes, system performance and associated works on site | 4 days | Technical Team/Site Management Team |
| Review site management and operations and implement actions to address any future exceedance of a management level. | 7 days | Technical Team/Site Management Team |
| Review the assumptions incorporated into the site water balance/leachate production rates/leachate extraction rates | 7 days | Technical Team/Site Management Team |
| Identify timescale for reduction of head(s) to maintain leachate elevations at or below Action Levels. | 7 days | Technical Team/Site Management Team |

Note: Assessment levels are used to manage leachate levels at the Site, to prevent a compliance limit breach. Therefore, the management system will be considered effective even if assessment levels are breached, providing compliance is maintained. The Agency are not required to be informed of an assessment level breach.

| Leachate – Discharge | | |
|---|---|--|
| Contingency Action | Response Time | Responsibility |
| Notify the EA and Operations Manager via the notification form as required by condition 4.3.2 of the Permit | 24 hours | Aftercare Technician/Aftercare Operative |
| Raise a CAR on Compas to ensure appropriate contingency actions are undertaken. | 48 hours | Aftercare Technician/Aftercare Operative |
| Review trends | 1 month (monitoring) /3 months (trends) | Operations Manager/EIR Manager/EIR Advisor |
| Agree action plan as necessary | 3 months or as agreed with the EA | Operations Manager/EIR Manager/EIR Advisor |

| Surface Water | | |
|--|-------------------------------|---|
| Contingency Action | Response Time | Responsibility |
| In the case of a breach where there is an obvious pollution incident | | |
| Establish the source and instigate preventative/corrective actions. If pollution incident inform EA immediately via the notification form as required by condition 4.3.2 of the Permit | 24 hours | Aftercare Technician / Aftercare Operative / Operations Manager / EIR Manager / EIR Advisor |
| Cease all discharge of suspected contaminated surface water to controlled water | Immediate and within 24 hours | Operations Manager |
| Raise a CAR on Compas to ensure appropriate contingency actions are undertaken. | 48 hours | Aftercare Technician / Aftercare Operative / Operations Manager |
| Action plan to be agreed following review, action plan to include: determine risk. If risk are unacceptable remedial actions to be implemented | 1 month | Operations Manager / EIR Manager / EIR Advisor / SUEZ Risk Team |
| Contingency Action | Response Time | Responsibility |
| In the case of a breach where a pollution incident is not obvious | | |
| Notify the EA and Operations Manager via the notification form as required by condition 4.3.2 of the Permit | 24 hours | Aftercare Technician / Aftercare Operative / Operations Manager / Advisor |
| Raise a CAR on Compas to ensure appropriate contingency actions are undertaken. | 48 hours | Aftercare Technician / Aftercare Operative |
| Verify results with the lab | 7 days | Aftercare Technician / Aftercare Operative |
| Re-sample | 1 week | Aftercare Technician / Aftercare Operative |
| Review trends and establish source | 1 months | Operations Manager / EIR Manager / EIR Advisor |
| Action Plan to be agreed following review, action plan to include: determine risk. If risk are unacceptable remedial actions to be implemented | 3 months | Operations Manager / EIR Manager / EIR Advisor / SUEZ Risk Team |

| Groundwater Contingency Actions | | |
|---|-----------------------------------|---|
| Contingency Action | Response Time | Responsibility |
| Notify the EA and Operations manager via the notification form as required by condition 4.3.2 of the Permit | 24 hours | Aftercare Technician / Aftercare Operative |
| In the case of an obvious pollution incident establish the source investigate preventative/corrective actions | Immediate | Operations Manager |
| Raise a CAR on Compas to ensure appropriate contingency actions are undertaken. | 48 hours | Aftercare Technician / Aftercare Operative |
| Verify results with the lab | 7 days | Aftercare Technician / Aftercare Operative |
| Re-test | 1 month | Aftercare Technician / Aftercare Operative |
| Review Leachate levels and groundwater quality trends | 3 months | Operations Manager / EIR Manager / EIR Advisor |
| Action plan to be agreed following review, action plan to include: determine risk. If risks unacceptable remedial actions to be implemented | 3 months or as agreed with the EA | Operations Manager / EIR Manager / EIR Advisor / SUEZ Risk Team |



Figure 1

Monitoring Location Plan

