Finmere Quarry Landfill and Materials Recycling Facility

Landfill Environmental Permit - EPR/FB3301CP
MRF Environmental Permit - EPR/AB3908CZ

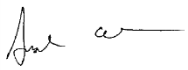
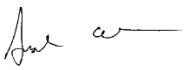
Odour Management Plan

OPES MRF 2013 Ltd

Project number: 60537533

February 2020

Quality information

Prepared by	Checked by	Verified by	Approved by
			
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Revision History

Revision	Revision date	Details	Authorized	Name	Position
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R02	24/02/2020	Initial Draft to Client	25/02/2020	A Graham	Project Manager
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1. Report Context

1.1 Introduction

AECOM has been commissioned by OPES MRF 2013 Limited ('the Operator') to prepare an Odour Management Plan (OMP) which covers both the landfill operations and Material Recycling Facility (MRF) operations being undertaken at the Finmere Quarry Site, Finmere, Buckinghamshire.

The Finmere Quarry site is located approximately 0.76km to the southwest of the village of Finmere in Buckinghamshire. The landfill site currently comprises:

- the operational landfill areas;
- areas in which landfilling has been completed and where restoration work is complete or underway;
- leachate storage tanks;
- landfill gas engines and flares within the generation compound; and
- a waste reception area which includes a weighbridge, site offices and wheel wash.

In addition to the landfill operations, the site also houses a MRF facility which is in a more central location in the site and shares the access road and waste reception area with the adjacent landfill.

1.2 Background

The landfill operations are regulated under Environmental Permit EPR/FB3301CV (previously EPR/KB3531RR) and the MRF is regulated under Environmental Permit EPR/AB3908CZ. Both are subject to regulation by the Environment Agency (EA).

Both permits contain conditions at section 3.3 which relate to the control of odour as shown in table 1 below

Table 1-1: Permit Conditions for Odour

Permit	Condition No	Requirement
EPR/FB3301CV	3.3.1	For the following activities referenced in schedule 1, table S1.1 (A1), emissions from the activities shall be free from odour at levels likely to cause pollution outside the site, as perceived by an authorised officer of the Environment Agency, unless the operator has used appropriate measures, including, but not limited to, those specified in any approved odour management plan, to prevent or where there is not practicable to minimise the odour.
EPR/AB3908CZ	3.3.1	Emissions from the activities shall be free from odour at levels likely to cause pollution outside the site, as perceived by an authorised officer of the Environment Agency, unless the operator has used appropriate measures, including, but not limited to, those specified in any approved odour management plan, to prevent or where there is not practicable to minimise the odour.
	3.3.2	The operator shall: a) If notified by the Environment Agency that the activities are giving rise to pollution outside the site due to odour, submit to the Environment Agency for approval within the period specified, an odour management plan which identified and minimises the risks of pollution from odour. b) Implement the approved odour management plan, from the date of approval, unless otherwise agreed in writing by the Environment Agency.

This Odour Management Plan (OMP) has been prepared to address the requirements of Section 3 of each environmental permit.

2. Background

2.1 Scope

The OMP has been developed in accordance with the Environment Agency's (EA) Horizontal Technical Guidance Note H4 – Odour Management (April 2011) and the EA's Guidance "Odour Management Plans for Waste Handling Facilities."

It should also meet the principles of the IAQM "*Guidance on the Assessment of Odour for Planning*" (July 2018).

Section 4 of the H4 Guidance states that all OMPs should as a minimum contain the following elements:

- an assessment of the risks of odour problems, from normal and abnormal situations, including worst case scenarios, for example of weather, temperature, or breakdowns, as well as accident scenarios;
- the appropriate controls (both physical and management) needed to manage those risks;
- suitable monitoring;
- actions, contingencies and responsibilities when problems arise;
- regular review of the effectiveness of your odour control measures; and
- emission limits where appropriate.

The OMP also requires inclusion of clear statements to demonstrate that the operator understands and accepts its responsibilities. In particular, it should show that the operator OPES MRF 2013 Ltd:

- either directly or through its contractors or subcontractors, will ensure that any odour control equipment is designed, operated and maintained such that it operates effectively to control odour at all times;
- is familiar with the characteristics of the processes and equipment on site and have identified the areas of risk of emissions from odour;
- will reduce or cease relevant operations if necessary, to review controls, to avoid serious odour pollution;
- will engage with neighbours to minimise their concerns and complaints; and
- will respond to complaints.

The remainder of this OMP follows the outline below:

- Section 3 – Overview of site activities and location;
- Section 4 – Assessment of odour risk;
- Section 5 – Proposed management arrangements;
- Section 6 – Normal operational odour control;
- Section 7 – Routine maintenance and inspection requirements;
- Section 8 – Odour control during abnormal events / maintenance; and
- Section 9 – Monitoring, recording and reporting.

3. Overview of Site Activities and Location

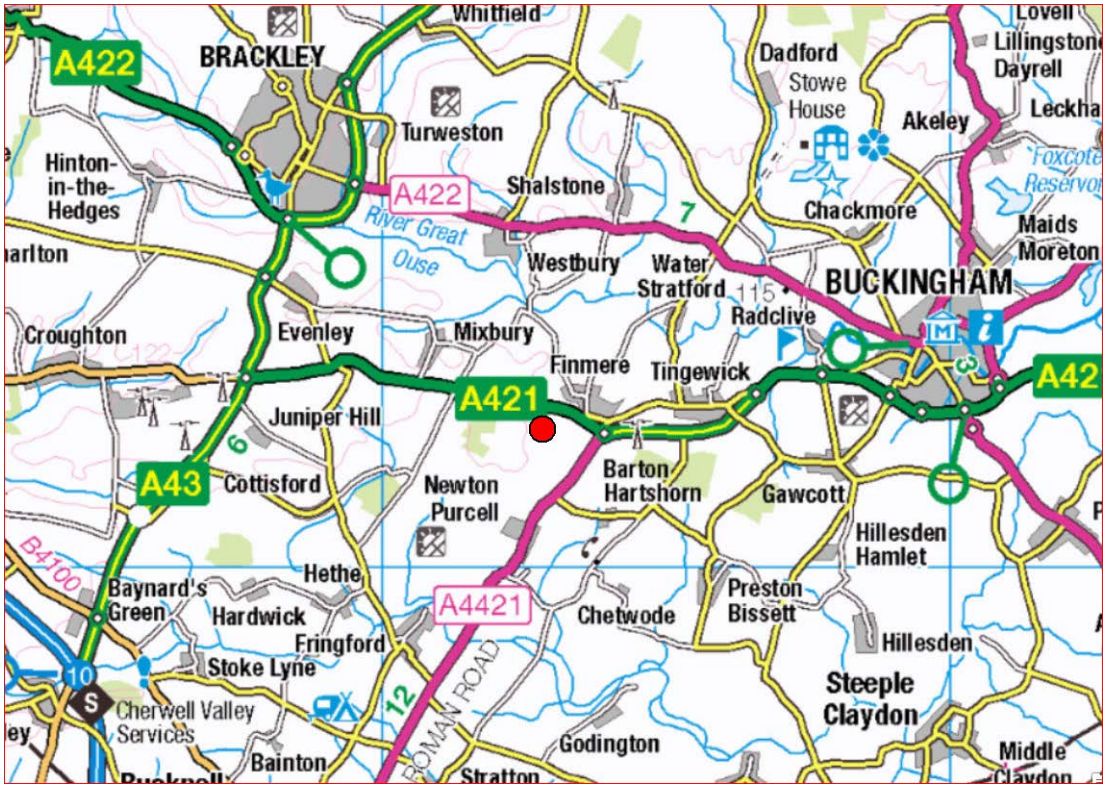
3.1 Site Location

Finmere Quarry is located in the north-east of Oxfordshire adjacent to the boundaries with Northamptonshire and Buckinghamshire. It is accessed off the A421 (Banbury Road) which runs north of the quarry and landfill site. Finmere village lies 760 metres to the north east from the site entrance and the site is situated 7.4 miles (12km) north east of Bicester.

The centre of the site is located at National Grid Reference (NGR) SP 62792 32421.

Figure 1 shows the location of Finmere Quarry, landfill and MRF.

Figure 1: Site Location



The site is in a predominantly rural setting with 6 farms surrounding the quarry, landfill and MRF. These include;

- Boundary Farm – approximately 400m to the southeast
- Barleyfields Barn Farm – approximately 447m to the southwest
- Bungalow at Foxley Fields Farm - approximately 378m to the northeast;
- Foxley Fields Farm – approximately 400m to the northeast;
- Widmore Farm – approximately 780m to the northwest with grade 2 listed status;
- Gravel Farm – approximately 936m to the northeast

There is a disused railway with planning permission for HS2 running along the west of the site which is approximately 476 metres to the centre of the site. Finmere aerodrome a former RAF station, now used for microlight flights and training is located approximately 1.1 km to the east of the centre of the site.

The nearest conurbation is Finmere Village covering an area of 6.35 km^2 with a population size of 466 (2011 Census; Office for National Statistics) which is located approximately 1 km to the north east of Finmere Quarry. The site is approximately 7 km west of Buckingham in Buckinghamshire and approximately just over 6 km east of Brackley in Northamptonshire.

3.2 Site Activities

3.2.1 General Operations

Operations on the site may comprise at one time:

- Waste acceptance via site weighbridge;
- Material recycling activities in an enclosed MRF building;
- Waste screening and crushing activities with the MRF yard area;
- Waste discharge onto a concrete reception pad for disposal at the landfill;
- Waste placement into the active landfill cell;
- Landfill cell construction activities associated with development of new cells; and
- Site restoration activities including capping and closure of cells.

Activities within the wider quarry associated with the winning of sands and gravel are not covered by the OMP.

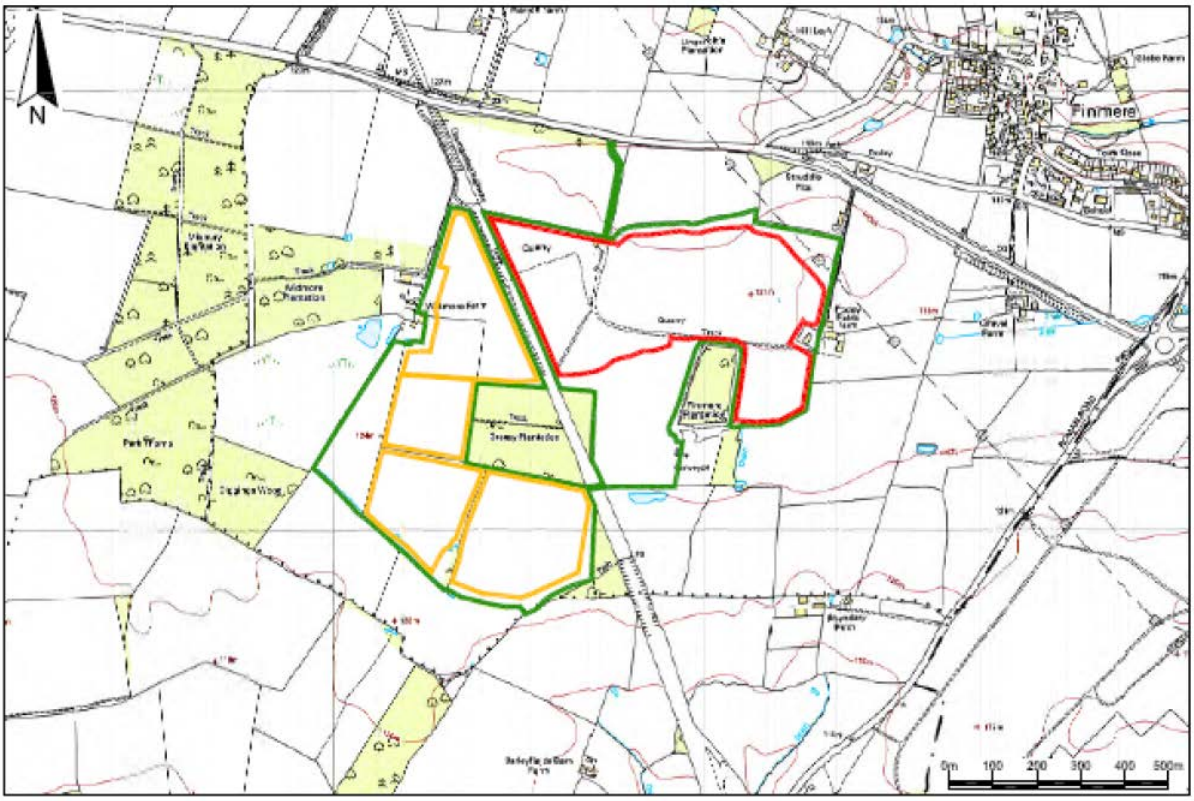
3.2.2 Landfill Operations

The landfill site is permitted to accept:

- Up to 250,000 tpa of mixed non-hazardous waste streams for disposal in the currently active non-hazardous landfill cells;
- Up to 150,000 tpa of inert waste streams for disposal in the inert landfill cells (yet to be developed); and
- Up to 50,000 tpa of suitable inert waste streams for use in restoration.

The installation boundary of the landfill is shown in figure 2 below.

Figure 2: Landfill Installation Boundary



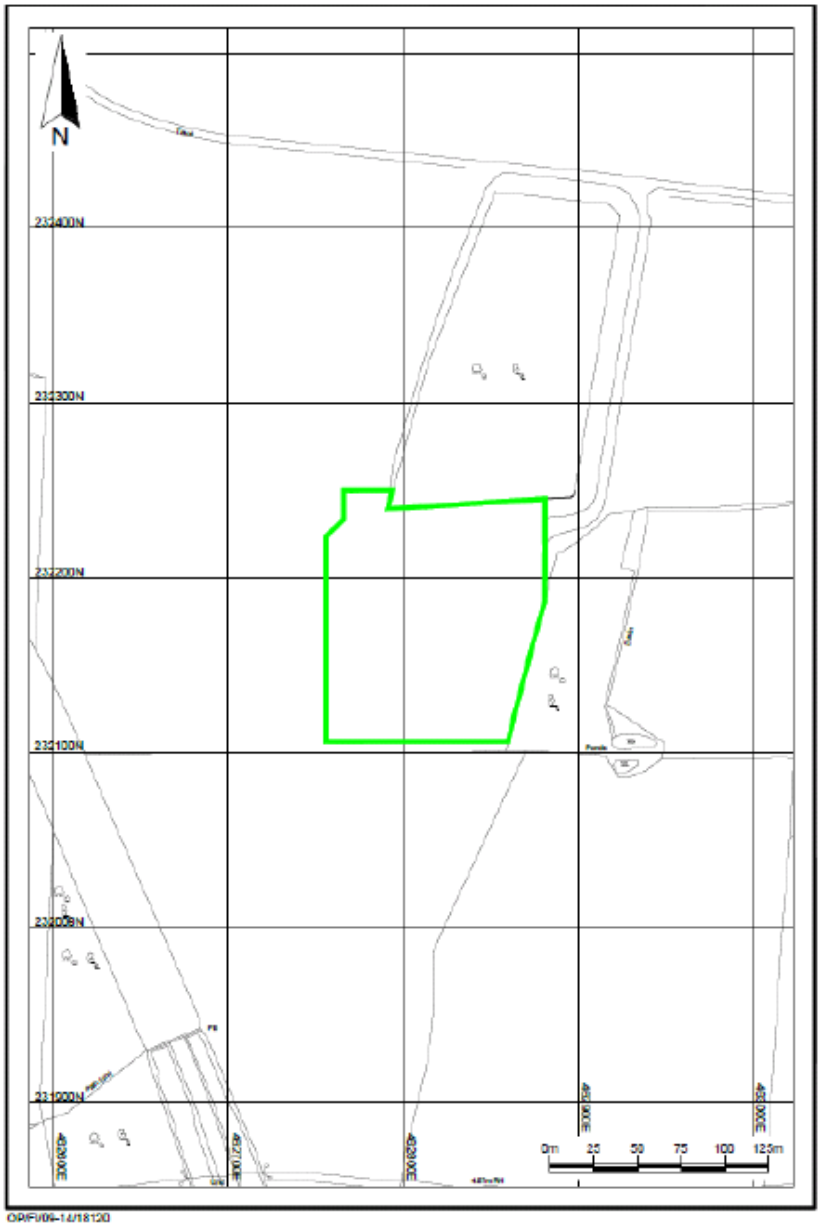
3.2.3 MRF Operations

The existing MRF facility is situated in a central location immediately to the south of Finmere Plantation which is visible in Figure 2 above. The MRF is constructed on concrete hardstanding and treats up to 150,000 Tonnes of general waste to produce a range of outputs which depending on the incoming waste streams may include some/all of the following:

- Wood;
- Metals;
- Papers and plastics which may sent from site as loose RDF;
- Aggregate materials; and
- Residual waste which will be sent for disposal in the adjacent landfill.
- .

The installation boundary of the MRF is shown in figure 3 below.

Figure 3: MRF Installation Boundary



The MRF includes:

- Waste reception bays for the receipt of incoming waste streams;
- Processing equipment including a pre-shredder, pre-screen, shredder, screens, trommel , handpicking line, overband magnet, various conveyors and a crusher;
- Storage bays for product outputs including sand, aggregates, and other inerts; and
- Waste storage skips for recovered metals and wood

Vehicles accessing the MRF use the weighbridge and gatehouse at the adjacent landfill site, and operators use the landfill site office/welfare facilities and mobile plant refuelling station.

3.3 Waste Acceptance

3.3.1 Hours of Acceptance

Waste will be accepted at the site in accordance with the site Planning Permissions as detailed in Table 1 below.

Table 3-1: Hours of Waste Acceptance

Day of Week	Hours
Monday to Friday	07:00 to 18:00
Saturday;	07:00 to 13:00
Sunday;	Closed for deliveries
Public Holidays;	Closed for deliveries

3.3.2 Waste Types Accepted

Waste types accepted at the site will be in accordance with Schedule 2 of each environmental permit.

4. Assessment of Odour Risk

4.1 Introduction

This section outlines the approach taken to evaluate the odour risks associated with the site as a whole. The impact evaluation process has been made reference to the appropriate guidance within:

- Environment Agency H1 Guidance, Annex A "Amenity and Accident Risks From Installations and Waste Operations";
- Environment Agency "A Practical Guide to Environmental Risk Assessment for Waste Management Facilities";
- Environment Agency Horizontal Technical Guidance Note H4 – Odour Management- How to Comply With Your Environmental Permit (April 2011);
- IAQM "*Guidance on the Assessment of Odour for Planning*" (July 2018).

4.2 Odour Risk Assessment Methodology

The evaluation methodology used involves three stages:

a. Source characterisation to identify the potential odour hazards and risks associated with the operation of the treatment and recycling plant;

b. Receptor evaluation to review the receptors that could be impacted by the odour hazards and risks from the operation of the treatment and recycling plant. This covers residential, commercial and industrial human receptors; and

c. Risk assessment that evaluates the odour hazards and risks in terms of the probability of occurrence and the severity of the impact on the identified receptors. The odour risk assessment also summarises the odour management plan approach that will be used to mitigate the identified risks.

4.3 Source Characterisation

4.3.1 Odour Hazard Identification

The odour hazard identification process draws on AECOM's knowledge of odour impact assessment on similar sites and applications.

4.3.2 Odour Emission and Type

In relation to odour releases the following has been identified as potential release sources:

- Waste reception activities including unloading of incoming waste from collection vehicles;
- Storage of incoming waste or processed waste for extended periods of time at the MRF leading to anaerobic decomposition of organic materials which may be present;
- Fugitive release from the agitation of the waste in the MRF during handling activities by mobile plant or processing plant;
- Fugitive releases from the tipping area and working faces during placement activities when waste being tipped or agitated by mobile plant;
- Fugitive releases from areas covered by daily cover or intermediate cover where cover is inadequate;
- Fugitive releases from cells which have temporary cap or permanent cap in place due to cracks/damage to the cap, issues caused by settlement or inadequate gas extraction/management;
- Landfill Gas or exhaust release from the LFG Utilisation Compound associated with ineffective combustion of gas in the flares or engines;
- Fugitive releases from leachate management to standing leachate within the wells, cracks or damage at base of well and interface with cap, inadequate gas extraction, leaks during periodic

pneumatic pumping operations in leachate wells or leaks during extraction of leachate into tanker for transportation off site; and

- ;Fugitive releases associated with cracks or damage at the base of gas management/monitoring infrastructure at the point it interfaces with the cap.

4.3.3 Odour Characteristics

Referring to 'Environment Agency Odour Guidance – Internal Guidance For Regulation Of Odour At Waste Management Facilities, July 2002, Version 3', the relative offensive nature of an odour is based on its nature and its hedonic tone which can be assessed using:

a. An Odour Wheel (Figure D1 of the guidance) which links commonly used descriptors of odours around waste management facilities with the most likely chemical cause and/or origin(s); and

b. Hedonic scores (Table D2 of the guidance), which provide a score to indicate the relative pleasantness or unpleasantness of the odour as determined by the person(s) making the assessment. Odours which are more offensive will have a negative hedonic score whilst the less offensive will have a positive score.

According to Figure D1 of the Guidance the MRF/landfill operations have the potential to have:

- a "rotting vegetation" odour associated with the anaerobic decomposition of organic matter which may be present in the incoming waste streams or created during the storage or disposal of waste; and
- a "musty, earthy, muddy" odour associated with the waste soils present in a significant portion of the incoming waste streams.

However, the range of wastes that could be accepted and how they are handled or stored means there is a much wider range potential of odour descriptors dependent on the conditions and as such reference has also been made to Sniffer report ; Odour Monitoring and Control on Landfill Sites: ER31 Final Report, SLR Consulting, January 2013. Combining the information from the reference documents has therefore resulted in the characterisation as presented in table 4.1 below

Table 4-1: Composition and characteristics of Odour Sources

Odour Source	Descriptors	Typical primary chemical odorants	Potential Hedonic Score
General domestic type wastes accepted via the MRF/landfill	Bottom of dusbin, rotten cabbage, fruity/citrus, acrid, sour, rotten, putrid.	Esters (e.g. Butanoates), odours directly from volatilisation of chemical from foods e.g. organic acids.	-2.76 (rotten fermented) -3.15 (rancid)
Other wastes accepted via the MRF/landfill	Sewage derivatives (faecal, sulphurous, rotten eggs)	Sewage derivatives (indoles, skatole, hydrogen sulphide, organic sulphides, ammonia)	-2.45 sulfidic
	Food waste (putrid, sour, fishy, rotten vegetables, rotten meat)	Food wastes (putrecine, cadaverine, amines, sulphides, ammonia)	-3.15 (rancid)
	Oils and fuels (oil acrid petrol like)	Oils and fuels (aromatics, toluene, xylene)	
	Green wastes (woody, ammonia, earthy) or soil based	Green waste (terpenes, amines, aromatics, ammonia)	-1.94
Landfill gas from cells (from fresh tipped wastes)	Sweet, sulphurous, fruity, citrusy, gassy, sickly, pungent	Typified by esters (e.g. butanoates) and organosulphurs (e.g. methanethiol, DMS, DMDS), hydrocarbons, alcohols and turpenes (e.g. alkyl benzenes, butanols, limonene. Acetegenic wastes may be characterised by organic acids (e.g. butyric/butanic acid)	-1.54 (etherish)
Landfill gas from cells (from methanogenic wastes)	Fruity, citrusy, gassy, sickly, pungent (less sweet and sulphurous than above)	Typified by limonene and hydrocarbons (e.g. alkyl benzenes etc) and less sulphurous compounds.	-2.3 (methogenic) -2.45 sulfidic
Leachate (young, poorly decomposed leachate)	Extremely sweet, sugary, pungent food, like, sulphurous.	Organic acids (e.g. butyric/butanoic acid), aromatics, alcohols, hydrocarbons and sulphur compounds.	-1.54 (etherish)
Leachate (mature well decomposed leachate)	Mild, fuel like, oily, ammonia, (if pH is high). Farm yard like.	Unburned hydrocarbons and nitrogen oxides.	-1.67 (oily/fuel like)

The application of best practice management measures described in later sections of this OMP should ensure the elimination or minimisation of emissions to an acceptable level.

4.3.4 Inventory of Odour Sources

To assist with the preparation of an inventory of odour sources and subsequent risk assessment, given the number of waste codes which can be accepted, the broad groups of wastes for the site have been classed according to their odour potential as follows:

Table 4-2: Odour Risk Potential of Waste Streams

Odour Potential				
Low Risk	Low – Medium Risk	Medium Risk	Medium – High Risk	High Risk
	01 01		02 01	
	01 03		02 02	
	01 04		02 03	
	03 01		02 04	
	03 03		02 05	
	04 01		02 06	
	04 02		02 07	
	09 01		06 09	
	10 01		06 11	
	10 02		07 02	
	10 03		19 02	
	10 04		19 05	
	10 05		20 01	
	10 06		20 02	
	10 07		20 03	
	10 08			
	10 09			
	10 11			
	10 12			
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	16 01			
	16 03			
	16 06			
	16 11			
	17 01			
	17 02			
	17 03			
	17 04			
	17 05			
	17 06			
	17 08			
	17 09			
	19 01			
	19 02			
	19 04			
	19 10			
	19 12			
	19 13			

An inventory of potential odour sources from the site activities in accordance with H4 (April 2011) is provided in Table 4:

Table 4-3: Inventory of Odour Sources

Source Description				Likely odorous compounds	Containment/Release Point	Odour Description	Intensity at or Near Release Point	Pattern of Release	Potential
Source	Type of Emission	Class	Odour Risk						
1. Receipt of waste	Fugitive	Class A	Low	Inert materials -	Vehicles closed or sheeted	Odour should be marginal	No odour expected	None expected	Very low – only if contamination found
		Class B	Low – medium	Non-putrescible materials in incoming wastes		Variable depending on the composition and age of waste	Odour is expected to be noticeable only in close proximity to vehicle (<1m).	Intermittent release, near to ground level (gas or leachate).	Only if load received contains a large proportion of rotting organic material
		Class C & Class D	Medium – High & High	Odours associated with the decay of organic materials contained in incoming waste			Odour is expected to be noticeable only in close proximity to vehicle (1-5m).	Intermittent release, near to ground level (gas or leachate).	
2. Waste Storage	Fugitive	Class A	Low	No odours expected	Inert waste stored in skips after treatment or external stockpiles	Inert materials	Contamination could cause odour.	Inert materials	Very low – only if contamination found
		Class B	Low – medium	Non-putrescible materials in incoming wastes	Material stored in inside the MRF building until it is transported for disposal in the active landfill cell.	Variable depending on the composition and age of waste	Odour is expected to be noticeable only in close proximity to vehicle (<1m).	Intermittent release, near to ground level (gas or leachate).	Only if load received contains a large proportion of rotting organic material and is left standing for long periods.
		Class C & Class D	Medium – High & High	Odours associated with the decay of organic materials contained in incoming waste			Odour is expected to be noticeable only in close proximity to vehicle (1-5m).		
3. Shredding, handling and processing of waste in the MRF	Fugitive	Class A	Low	None - Inert materials -	During processing.	Odour should be marginal	No odour expected	None expected	Very low – only if contamination found
		Class B, C & D	Low – medium Medium – High & High	Odours associated with the decay of organic materials contained in incoming waste	Associated with the action of processing of wastes that may contain organic materials.	Variable depending on the composition and age of waste	Odour is expected to be noticeable only in close proximity to waste source (<1m).	Intermittent release, near to ground level.	Equipment failures may result in extended holding times for waste.
4. Tipping of Waste in Landfill Cell	Fugitive	Class A	Low	None - Inert materials	Point at which the material is tipped and uncovered areas.	Odour should be marginal	No odour expected	None expected	Very low – only if contamination found

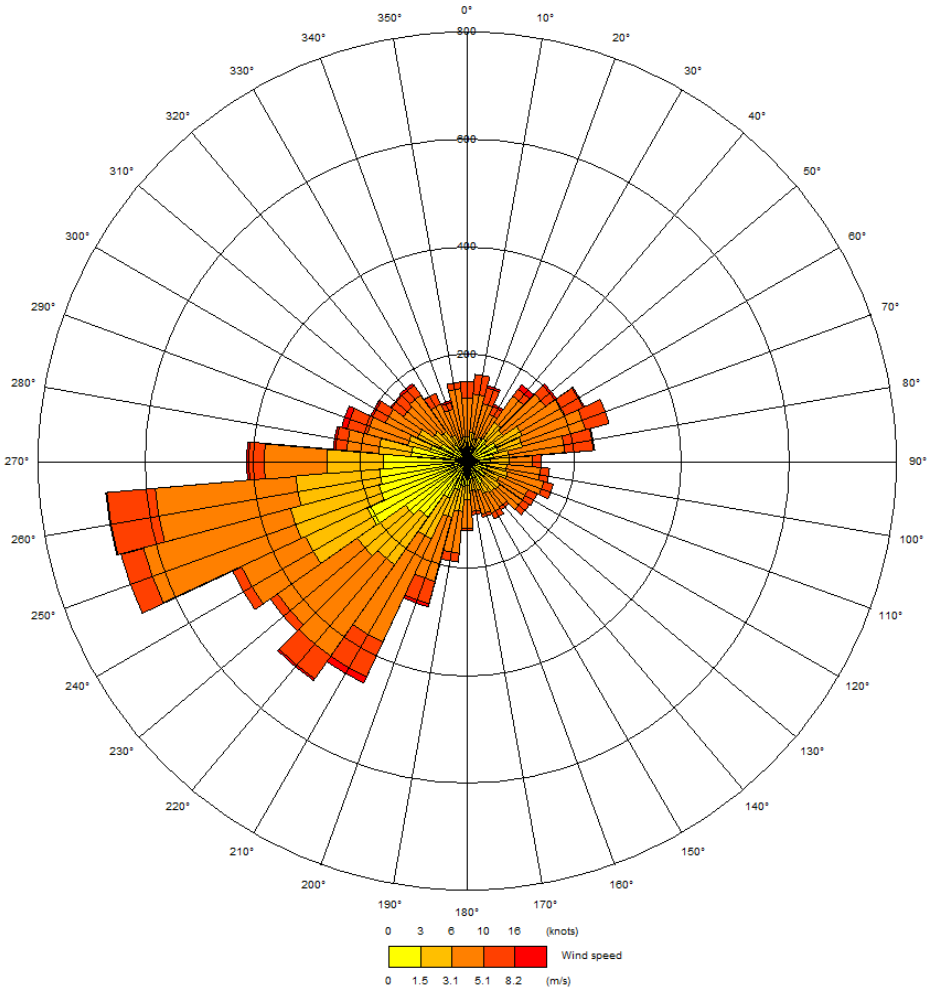
		Class B, Class C & Class D	Low - Medium and High	Odours associated with the decay of organic materials contained in incoming waste	Point at which the material is tipped and uncovered areas.	Variable depending on the composition and age of waste.	Can be generally understood from monitoring data taken from gas probes.	Intermittent release, near to ground level. Dependant on weather conditions.	Only if load received contains a large proportion of rotting organic material.
5. Cells with insufficient daily or intermediate cover	Fugitive	Inert cells	Low	None - Inert materials	Surface of landfill	Odour should be marginal	No odour expected	None expected	Very low – only if contamination found
	Fugitive	Non-haz cells	Low - Medium and High	Odours associated with the decay of organic materials contained in buried wastes.	Surface of landfill	Variable depending on the composition and age of waste.	Can be generally understood from monitoring data taken from gas probes.	Intermittent release, near to ground level. Dependant on weather conditions.	Only if the waste in-situ contains a large proportion of rotting organic material.
6. Cells with temporary or permanent cap	Fugitive	Inert cells	Low	None - Inert materials -	No odours associated with inert materials	Odour should be marginal	No odour expected	None expected	Very low – only if contamination found
		Non-haz cells	Low - medium	Odours associated with the decay of organic materials contained in buried wastes.	Release through cracks and tears on the surface as a results of insufficient gas extraction or settlement.	Variable depending on the composition and age of waste.	Can be generally understood from monitoring data taken from gas probes or directly checking cracks for gas levels.	Intermittent release, near to ground level. Dependant on weather conditions.	Only if the waste in-situ contains a large proportion of rotting organic material.
7. Gas compound	Fugitive	N/A	Low - Medium	Odours associated with ineffective gas combustion.	Release through insufficient gas extraction. Buried / damaged gas tanks. Cracks around pipe connections.	Variable depending on the composition of the gas.	Can be generally understood from monitoring data sampled directly from the gas storage tank.	Intermittent release, near to ground level. Dependant on weather conditions.	Equipment failures or not following extraction methodology may result in LFG leakage.
8. Gas monitoring / management in cells	Fugitive	Non-haz cells	Medium - High	Odours associated with LFG composition, associated with decay of organic materials contained within the buried waste.	Release through insufficient gas extraction. Buried / damaged gas probes. Cracks around probe interface.	Variable depending on the composition of the gas.	Can be generally understood from monitoring data taken directly from the probe.	Intermittent release, near to ground level. Dependant on weather conditions.	Equipment failures or not following extraction methodology may result in LFG leakage.
9. Leachate well	Fugitive	Non-haz cells	Low - medium	Odours the release of gas from the liquor.	Release through insufficient gas extraction. Buried / damaged leachate well. Cracks around well/liner interface.	Variable depending on the composition and age of waste.	Can be generally understood from monitoring data taken directly from the leachate well.	Intermittent release, near to ground level. Dependant on weather conditions.	Only if the waste in-situ contains a large proportion of rotting organic material.
10. Leachate drains and sumps	Fugitive	See above in 2.	Medium - High	Odours associated with the decay of organic materials contained in	Release through insufficient gas extraction. Buried /	Variable depending on the composition and age of waste.	Can be generally understood from monitoring data taken	Intermittent release, near to ground level.	Only if the waste in-situ contains a large proportion of

				the liquor deriving from the buried waste	damaged leachate drain/sump. Cracks around drain/liner interface.		directly from the leachate drain sump or pump.	Dependant on weather conditions.	rotting organic material.
11. Leachate storage	Fugitive	N/A	Medium - high	Odours associated with the decay of organic materials contained in the liquor deriving from the buried waste	Release through leaks or venting from tank,	Variable depending on the composition of the leachate.	Can be generally understood from monitoring data taken directly from the leachate. However, odour levels may be accelerated if there is an incident where tanks have leaked leachate.	Intermittent release, near to ground level. Dependant on weather conditions.	Equipment failures or may result in leachate leakage.
12. Leachate removal / tanker pumping operations	Fugitive	See above in 2.	Medium - High	Odours associated with the decay of organic materials contained in the liquor deriving from the buried waste	Vehicles tanker leaks. Loose pipe connections.	Variable depending on the composition of the leachate.	Can be generally understood from monitoring data taken directly from the leachate. However, odour levels may be accelerated if there is an incident where vehicles have a leak of leachate.	Intermittent release, near to ground level. Dependant on weather conditions.	Equipment failures or not following extraction methodology may result in leachate leakage.

4.4 Meteorological Conditions

Wind speed and directional data has been obtained from RAF Brize Norton, Royal Air Force Met station (Lat 51.758 Lon -1.567), for the period 2019 and is presented in the figure below.

The prevailing wind direction, based on the statistical mean wind direction, is from the south-west and heading north east.



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4.5 Sensitive Odour Receptors

Sensitive odour receptors which could be impacted by the operation of the plant include residential, commercial and industrial receptors, with the likely receptors listed in Table 4.4 below:

Table 4-4: Odour Risk Potential of Waste Streams

No	Receptor	Approximate Closest Distance from Site (m)	Direction from Site	Grid Reference
R1	Foxley Fields Farm (unhabited)	265	Northeast	463131, 232442
R2	Glanwin Meadow	570	Northeast	463386, 232557
R3	Foxley	640	North, Northeast	463217, 232821
R4	Barley Fields	750	South, Southeast	463055, 231361
R5	Finmere Village	760	Northeast	463518, 232784
R6	Hill Leys	820	North	463032, 233053
R7	Boundary Farm	380	Southeast	463071, 231845
R8	Gravel Farm	675	East, Northeast	463532, 232509
R9	Barleyfields Barn Farm	650	South, Southwest	462584, 231479

No	Receptor	Approximate Closest Distance from Site (m)	Direction from Site	Grid Reference
R10	Widmore Farm	645	West, Northwest	462201, 232488
R11	Swan School of Dog Training	737	Northeast	463400, 232651
R12	MKB Technical Services	985	Northwest	463027, 233054
R13	Finmere Aerodrome	1000	East	464339, 232223
R14	Bridleway 7	0	Within site	462963, 232236
R15	Bridleway 6/Footpath 5	0	East Boundary	463077, 232272
R16	Finmere Plantation	0	Within site	462856, 232328
R17	Field Cottages	760	Southeast	463608, 231432
R18	Home Farm	760	South	463411, 231215
R19	Station House	630	South, Southeast	462880, 231221
R20	Footpath 4	0	Within site	462633, 232673

4.6 Odour Risk Assessment

4.6.1 Introduction

The odour risk assessment has been completed by considering each of the odour sources identified in Section 4.3.3 above in terms of:

- Frequency of occurrence;
- Intensity of odour released;
- Pathways and receptors involved;
- Environmental consequence(s) of the event;
- Overall risk and its significance to the environment; and
- Control and mitigation measures needed to prevent or reduce the risk.

The odour risk assessment has also considered potential odour sources which may be encountered during maintenance and abnormal conditions or situations.

4.6.2 Scoring Mechanism

The risk assessment methodology has been developed using a scoring mechanism, whereby scores are assigned to:

- The probability of the hazard occurring without the use of protective measures;
- The consequences of the hazard to the environment or human health; and
- The effectiveness of the control/mitigation used to prevent the hazard occurring.

The scoring system used for the assessment is shown in Table 4.5 below.

Table 4-5: Risk Assessment Scoring Mechanism

FREQUENCY OF OCCURRENCE		
Frequency	*Comment*	*Score*
Never	Incident occurs once every 100 to 10,000 years	1
Very Unlikely	Incident occurs once every 10 to 100 years	2
Unlikely	Incident occurs once every 1 to 10 years	3
Somewhat Unlikely	Incident occurs at least once per year	4
Fairly Probable	Incident occurs at least once per month	5
Probable	Incident occurs at least once per week	6
CONSEQUENCE OF HAZARD TO ENVIRONMENT OR TO HUMAN HEALTH		
Consequence	*Comment*	*Score*
Minor	• Onsite nuisance only no outside complaint • No breach of permit	1
Noticeable	• Nuisance noticeable off-site • Potential for 1 – 2 complaints • Reportable breach of permit	2
Significant	• Severe sustained nuisance • Major breach of environmental permit • Numerous public complaints	3
Severe	• Partial plant shutdown required • Replacement of part of plant • Regulator (EA/HSE) involved	4
Major	• Full plant shut-down required • Regulatory prosecution likely	5
EFFECTIVENESS OF MITIGATION		
Mitigation Factor	*Comment*	*Score*
Non-existent	No mitigation in place	1
Ineffective	Some minor controls in place but mitigation not achieved	2
Partly effective	Basic controls in place and hazard partly mitigated but significant residual risk remains	3
Effective	Basic controls in place and hazard mitigated to an acceptable level although moderate level of residual risk may exist	4
Very effective	Processes fully controlled (basic/advanced) and hazard mitigated to recognised standard. Some minor residual risk may remain	5
Entirely effective	Processes fully controlled to level in excess of recognised standards. Hazard mitigation entirely effective and no residual risk remains	6

The completed risk assessment is attached at Appendix A.

5. Management Arrangements

5.1 Structure

Environmental responsibility for individual operations will be assigned throughout the site management structure and are defined through the management system.

The General Manager is the designated management representative, with overall control of the management system at the plant including the ability to ensure programmes are realised and translated into activities on the plant.

Operational staff for the landfill and MRF are shared to provide operational flexibility. Some brief descriptions of the responsibilities of those staff that are involved in operating the plant are outlined below.

Table 5-1: Roles and Responsibilities

Position	Responsibility
Managing Director	The Managing Director will have overall responsibility for employees and operations; will report into and liaise with the Board on contract and operational issues; will have overall responsibility for maintenance and refurbishment; and will work with the Board to source suitable third party waste for disposal at the Facility.
General Site Manager	The General Site Manager acting as the day-to-day manager of facility operatives, will have responsibility for ensuring that: ▪ The site is available to receive waste; ▪ The site is operating within the parameters of the Environmental Permit and appropriate planning regulations including odour management requirements; ▪ Any odour complaints are fully investigated, and appropriate corrective action is taken as necessary; and ▪ Regular daily 'sniff tests' are undertaken to check for odour. ▪ Responsibility for ensuring that structural and moving parts are operating as per the operating manual and in line with SHE requirements. ▪ Will be responsible for ensuring that sufficient replacement parts and consumables are on site for continuous operation to occur. The Assistant Site Managers will report directly to the General Site Manager.
TCM Landfill	The TCM is the CoTC (Certificates of Technical Competence) Holder for the Landfill and is responsible for : ▪ Ensuring compliance with the landfill environmental permit; ▪ Completion of daily SNIFF tests; ▪ Completion of monthly perimeter ambient and perimeter boundary gas borehole monitoring ▪ Completion of leachate monitoring; and ▪ Ensuring completion of any surface/ambient monitoring using FID.
TCM MRF	The TCM is the CoTC (Certificates of Technical Competence) Holder for the MRF and is responsible for : ▪ Ensuring compliance with the MRF environmental permit; and ▪ Liaising with the Landfill TCM regarding any potential odour issues identified by monitoring which are due to MRF operations.
Assistant Site Managers – each permit area	Will be responsible for overseeing team operatives in the operation of the MRF and landfill, will have responsibility for ensuring plant operation in line with the operating manual and in line with SHE requirements.
Plant Operators	The Plant Operators will be experienced in operating loading equipment and will be certified as competent via the CITB training scheme or equivalent. MRF plant operator: ▪ Responsible for the daily inspection of the shredders, conveyors and other MRF equipment. ▪ Ensure that the mobile deodoriser is positioned and operating correctly if required at MRF. ▪ Ensure that dust is supressed via the mobile bowser on equipment and facilities to prevent fugitive releases of odour and dust. ▪ Construct stockpiles away from doorways so fugitive odour is reduced from becoming windblown.

Position	Responsibility
	Landfill plant operator: ▪ Responsible for the daily inspection of landfill compactors and other landfill equipment; ▪ Responsible for the application of daily cover to reduce fugitive releases from the cells; ▪ Ensure that the static/mobile deodorisers are positioned and operating correctly at the landfill. ▪ Ensure that integrity of current boreholes, gas infrastructure is upheld, and any damage is recorded. The Plant Operator will be responsible for the daily inspection of the equipment, defect reporting, stockpiling and loading operations and maintaining the safety and security of the tipping floor. Liaison with the Weighbridge Operator with regard to incoming and outgoing vehicles will form part of the postholder's duty.
Weighbridge Operator	An experienced Weighbridge Operator will ensure that vehicles entering the site are authorised using the computerised transaction system. In addition, the correct operation of the weighbridge, the computerised transaction recording, duty of care checks and liaising with the Plant Operator by radio will form part of the postholder's duties. The weighbridge operator will be responsible for identifying any particularly odorous waste loads delivered at the point of waste acceptance.
Site Surveyor	Qualified surveyor who is responsible for undertaking all site survey requirements including monitoring cell levels to ensure filling in accordance with approved plan and monitoring of relevant levels to facilitate accurate monitoring of leachate in accordance with site permit requirements.

The site management team is also assisted by external appointed specialists including:

- Liaison Manager – appointed sub-contractor which is a resource shared with the Land/Quarry Owner to facilitate discussions with the local community;
- External Environment Manager – appointed sub-contractor – to provide support in relation to environmental management;
- Gas and Leachate contractors to facilitate development and management of the relevant gas and leachate management infrastructure; and
- Other specialist consultants providing support in relation to regulatory compliance, engineering and design, planning support and odour investigation.

5.2 Technical Competence

A technically competent person will be available on site in accordance with the regulatory attendance requirements. In his absence a nominated deputy will be available. The technically competent person, or nominated deputy, will be responsible for the control of incoming and outgoing vehicles, checking Duty of Care documentation, inspecting waste to ensure compliance with permit conditions, keeping and maintaining all records. The technically competent person, or nominated deputy, will have overall responsibility for ensuring high standards of housekeeping and odour control are maintained throughout the site.

5.3 Training Provision

All staff will receive instruction and training, both verbal and documented, in all relevant aspects of operational procedures, permit requirements in relation to operations and the environment, health and safety and general requirements of the site management plan. A copy of the permit and approved site management plan will be kept available on site for reference when required by all site staff carrying out work under the requirements of the permit.

Training will be delivered in the workplace by internal training staff or by managers, although formal training courses such as CITB certification for plant operators or CoTC certification for TCM personnel will be employed were required.

In relation to odour management, this will be incorporated into the general site operational training and will cover odour awareness in relation to normal, abnormal and maintenance situations and include management of odour complaints.

5.3.1 New Starters

Each position at the site will be covered by a general job description detailing key skills, responsibilities and reporting structure. It will be standard procedure for new process operators to be given comprehensive “on the job” training before they take full responsibility for their post. Supervision will be provided for as long as is necessary to ensure that the required skills have been imparted..

5.3.2 Contractors

Site rules will be provided to all contractors using or visiting the site. These rules will describe basic safety and operational precautions to be observed while at the site.

Instances of drivers or contractors not following site rules or behaving inappropriately will result in warnings. If necessary, requests to leave site and/or barring from future visits to the site will be implemented.

6. Normal Operational Odour Control

6.1 Waste Acceptance

6.1.1 Acceptance Procedures

All vehicles delivering contaminated materials and waste will have to pass through the main entrance to the Finmere Quarry, where the weighbridge and gatehouse facilities will be used.

At the weighbridge, the operator will evaluate the incoming waste load in accordance with site procedures. Providing the incoming waste is acceptable, the driver will be provided guidance of the route to discharge point – this will generally be a designated area of the MRF although some waste may be tipped direct to landfill (e.g. daily cover) or tipped on the restoration material stockpile. In the event that waste does not meet the conditions specified in the Environmental Permit, or is particularly odorous, the load(s) will be rejected in accordance with site procedures.

The vehicle, quantity, type and origin of the waste will be recorded in accordance with the Environmental Permit.

6.1.2 Acceptance of Agreed Odorous Waste Streams

Wastes identified as being difficult due to their potential odorous nature will be required to book in the day before.

Discussions will be held with the producer of the waste, prior to the acceptance of such waste, to ensure pre-treatment of the waste to reduce its odour potential is undertaken prior to delivery and that appropriate containment measures are employed. If such controls can't undertaken by the produced then the waste loads will be rejected.

6.1.3 Waste Composition

The Operator will employ strict control so as to prevent the acceptance of malodourous wastes and retain the right to reject any waste which is deemed to jeopardise the ability to manage the site and prevent the emission of unacceptable odours. Rejected waste will be diverted straight to an appropriate landfill or treatment facility.

In the event that malodourous waste is identified by the site operators during load discharge/offloading, then the waste will be reloaded onto the vehicle where practicable and then diverted off site as soon as possible for final disposal or further treatment. If immediate removal of the waste from site cannot be arranged then disposal in the landfill cell with immediate placement of cover material will be arranged.

Records of malodorous waste will be maintained retained.

6.2 Storage of Waste and MRF Process Outputs

During normal operational periods, incoming, processed waste and recyclates will be stored for time periods in the MRF area in accordance with the timeframes in the Table 6.1 below:

Table 6-1: Waste Storage Times

Material	Maximum Volume Stored (m^3)	Maximum Storage Period (Days)
Waste Acceptance		
Incoming waste	550	1
Recovered Materials Stored Internally		
Mixed paper, card, textile	750	3
Residuals	1,500	3
Recovered Materials Stored Externally		
Aggregate materials	1,650	30
Wood	750	3
Metals	750	30

Any residual material that is putrescible will be removed from the MRF and landfilled before the end of each day to prevent vermin and reduce odour.

6.3 General Cleaning

Operational areas, machinery and wheeled loaders within the facility, plus external roads and drainage channels will be regularly cleaned so as to prevent the build-up of odour from old degrading material. The facility will be inspected on a weekly basis and deep clean will be scheduled annually, unless the inspection identifies the need for additional cleaning.

6.4 MRF Normal Operational Odour Control

During normal operations, operatives should refrain from leaving personnel doors on the north/east side of the MRF building (i.e. the predominant wind direction) open.

All doors that can be closed will be closed to reduce fugitive emissions during high winds.

The internal mister system will be used to dampen down the waste stockpiles as necessary to assist with odour reduction.

A mobile deodoriser can also be deployed if necessary.

6.5 Landfill Operations Normal Operational Odour Control

Detailed operational controls are presented in Appendix B which will be referred to by operational staff. The main controls are summarised below.

6.5.1 Active Waste Cell

Waste will be placed and compacted progressively through the day in accordance with site procedures.

Daily cover will be placed over deposited waste to a depth of 200 mm to prevent fugitive releases of odour. Cover will be progressively placed through the operational day.

If tipping in the cell is to be ceased temporarily (i.e. longer than 3 days) then an additional temporary cover will be applied in line with company procedures. Depth of the temporary cover will be at least 300 mm.

6.5.2 Disposal of High odour Risk Waste Streams

The management practices in place at the installation include the pre-vetting of odorous waste and consideration of the distance to sensitive receptors. Therefore, the criteria that will be adopted for the closure of the installation to high-risk waste streams are not considered necessary.

The Weighbridge Operator will advise the plant operatives of the arrival of any high odour risk waste so that appropriate preparations to receive the waste can be made at the operational area.

High odour risk waste will be deposited in front of the working face and will be covered immediately by other non-malodorous waste materials or daily cover.

The size of the tipping area can be reduced to control odour levels and the process of progressively compacting the waste during the day using mobile compaction equipment will assist in the prevention of odours.

6.5.3 Capped Areas

Capping is required after the completion of landfilling/tipping operations. There can be temporary cap applied which may be removed to resume tipping, and a more permanent cap which may be part of the final restoration.

6.5.3.1 Temporary Cap

Temporary capping is applied to area that are to be non-operational for a month or more. Temporary capping consists of 0.5m soil/clay or a suitable membrane.

The cap will be placed in a manner which avoids building up layers of impermeable material as this may impede movement of landfill gas.

Wherever possible, measures will be taken to ensure that previously emplaced waste is not disturbed, exposed or moved.

6.5.3.2 Permanent Cap

Installation of the permanent containment cap subject to CQA and as such all construction work will be completed in accordance with the approved CQA Plan.

Wherever possible, measures will be taken to ensure that previously emplaced waste is not disturbed, exposed or moved.

Once the cap is in place:

- Monthly balancing of gas field;
- Gas monitoring will take place at the perimeter boreholes and at designated ambient locations in accordance with the permit; and
- Full cap will be inspected using TDL or similar techniques annually in accordance with the environmental permit. This will facilitate identification of potential fugitive release hot spots related to damage or deterioration of the cap.

6.5.4 Avoiding Disturbance to Previously Emplaced Waste

Wherever possible, measures will be taken to ensure that previously emplaced waste is not disturbed, exposed or moved. In the event that it is disturbed, (e.g. during the installation of gas and leachate monitoring and extraction wells), it will be removed and buried on the same day.

Larger areas taking more than one day to complete will be subject to a method statement to be agreed with the Environment Agency.

6.5.5 Leachate

Leachate will be managed in accordance with a Leachate Management Plan.

All leachate extraction wells and monitoring points will be fitted with a cap or bullet to minimise potentially odorous emissions. Leachate is stored in a sealed tank. The leachate management system is checked weekly and this includes checking and maintenance of seals to minimise any odour emission.

Steps will be taken to avoid leachate build up including leachate extraction.

Inspection and maintenance of tanks, leachate wells and sumps will happen on a regular basis to ensure no leaks taking place.

Tanker loading of leachate should be adequately supervised to ensure that no spills occur.

6.5.6 Landfill Gas

Landfill gas will be managed in accordance with a Gas Management Plan (GMP).

Landfill gas and associated odours arising from the breakdown of organic material (i.e. methanogenesis) will be collected through the gas infrastructure from the gas field. Gas will then flow through the active extraction system and utilised in a power generation plant where practicable, or alternatively be flared.

As cell filling progresses a horizontal gas collection system will be installed in operational areas and following completion of operations a gas extraction system will be installed progressively in the parts of the installation that have been capped and restored.

The gas system will be monitored and the gas field will be rebalanced at least monthly. All gas stacks, boreholes, leachate extraction wells and monitoring points will be fitted with a cap or bullet to minimise potentially odorous emissions.
Inspection and maintenance will happen on a regular basis to ensure that balances and suction equipment is in full working order.

The gas compound is equipped with telemetry monitoring and the capability of remote access by the gas contractor. In the event the gas engines trip, the site flares should automatically become operational. All faults will be dealt with as a matter of urgency in accordance with the GMP.

6.6 Odour Suppressant Systems

The site will operate :

- A fixed odour suppressant system which is installed along the northern boundary of the site. This will be in constant operation during periods when active landfill disposal is taking place and during periods when activities such as installing wells through waste is occurring; and

- Two mobile odour suppressant units which can be moved around the site in response to specific work activities or issues. Additional units can be temporarily hired if needed.

The Operator will liaise with the local community in regards of the choice of suppressant that affords the best control.

7. Maintenance and Inspection Requirements

7.1 Plans and schedules

A series of maintenance and inspection procedures have been developed for the site.

This maintenance plan includes:

- A significant element of planned preventative maintenance to ensure high performance and availability of plant;
- Descriptions along with procedural steps and responsibilities will be allocated and records kept, with a sign-off document for any issues encountered in relation to odour control;
- The maintenance scheduling will make reference to any statutory requirements and manufacturer's recommendations regarding odour control;
- Major maintenance work will be documented and records kept for inspection;
- Any repairs will be completed as soon as practicable; and
- If any waste becomes odorous during storage or during periods of routine maintenance, it will be removed to the landfill and covered.

7.2 Plant and Equipment

All plant items and equipment (e.g. loading shovels, odour demisting systems, etc) will be serviced and maintained according to manufacturer's schedules and recommendations in order to minimise the risk of breakdown.

Plant and equipment will be inspected and serviced by the Operator utilising a plant inspection pro-forma. Standby equipment for some critical items may be required.

7.3 Defect Reporting and Reactive Maintenance

Mobile and fixed plant will be subject to a first use check on a daily basis to facilitate defect detection and reporting.

Defects will be logged and reported to the CoTC holder so that repairs can be scheduled.

7.4 Emergency

In the event of a site emergency, the Site Manager will be notified immediately. The emergency measures will be implemented as a priority to mitigate the incident, as appropriate and are detailed in Section 8 and Appendix C.

8. Odour Control During Abnormal Events

This section outlines a summary of foreseeable situations which may compromise the operator's ability to control and / or minimise odorous emissions and summarises the actions to be taken to minimise the impact.

8.1 Abnormal Situations

The following scenarios have been identified that may affect odour control:

- Delivery of malodorous waste;
- Storage of waste in MRF during long periods of time due to plant shutdown;
- Plant and equipment malfunction or breakdown;
- Electrical failure;
- Unusual weather conditions;
- Inadequate cover or capping;
- Inadequate gas control;
- Issues with leachate infrastructure;
- Disturbed waste;
- Closure of disposal outlets;
- Flood; and
- Staff availability.

8.2 Mechanical Repairs and Breakdowns

Mechanical problems or breakdowns which may require the replacement or repair of component parts and render plant/equipment required for odour control ineffective or non-operational have been considered.

To minimise and mitigate the potential impact of such breakdowns the following will be in place:

- A preventative maintenance schedule will be developed to reduce the risk of plant breakdown;
- A list of suppliers or contractors for critical equipment and/or standby equipment will be maintained; and
- Third party maintenance personnel for the LFG Utilisation Compound can be called to the site in the event of any breakdown of critical plant. The site will respond within 8 hours of such breakdowns and repairs will be effected within 24 hours if practicable. The EA will be notified of any breakdown which has the potential to cause environmental pollution or in the event that repairs will mean the plant outage will take longer than 24 hours to rectify.

8.3 Maintenance

Where planned and emergency maintenance of plant or equipment is required, and there is a likelihood of odour being released to atmosphere in quantities sufficient to result in detection of odour by offsite receptors, a detailed risk assessment of the activity will be conducted to assess potential for odour generation, release and control.

8.4 Abnormal Events Management Plan

Environmental accident prevention, including odour controls, will be managed within the overall site health, safety, quality and environmental management programme. Management and procedures relating to such emergency preparedness and response will be documented within an Emergency Procedure.

In respect of odour management individual elements of the abnormal events management plan are outlined below.

- Defect reporting procedures – maintained in the site Operations Manual covering all reasonably foreseeable incidents, the procedure will detail how to report the defect, communication routes and mechanisms for corrective and mitigating action;

- Investigation and reporting procedure – this will deal with the reporting, investigation and recording of any incidents relating to odour control at the site including those associated with external complaints;

- Incident Controller – this will normally be a site supervisor identified in the plan, who will have the responsibility to mobilise and co-ordinate a response team and will be responsible for all communications with external stakeholders and the regulator as necessary;

- Emergency equipment – including critical spares and standby plant arrangements; and

- Contingency tipping – the plan will detail the alternative tipping arrangements that can be made available in the event that the recycling operation has to cease.

Specific actions in relation to the management of odour during the above identified abnormal events are detailed on the control matrix at Appendix C.

9. Monitoring, Recording and Reporting

9.1 Overview of the Monitoring Plan

To ensure that odorous emissions from the facility do not result in nuisance at sensitive receptors, the Operator will monitor odour emissions through:

- Daily site inspection, using 'sniff tests' to assess odour at specified points;
- Daily monitoring of meteorological information and weather forecasts;
- Monitoring of odour complaints; and
- If a sustained period of justified odour complaint should arise, the Operator will review existing procedures and other management and control techniques as necessary.

9.2 Monitoring Plan

There are no specified monitoring requirements within the Environmental Permit (EPR/AB3908CZ or EPR/FB3301CV)).

The location, atmospheric pressure, weather conditions and temperature will be recorded as part of the site procedures. Odour will be monitored using the following methods:

9.2.1 Monitoring of Meteorological Information

Monitoring of meteorological information and weather forecasts can assist in the management of odour emissions from the site. Some meteorological conditions can exacerbate the risk of odour annoyance at sensitive receptors, for example low odour dispersion caused by cold temperatures and low wind speed.

Monitoring of meteorological information and weather forecasts will be used in the following ways:

- To predict when weather conditions are likely to cause poor odour dispersion, to enable site controls to be amended if required;
- To plan where monitoring of the site boundary should take place during normal operations in order to correctly assess odour impacts;
- To predict the areas where potential odour impacts may occur during abnormal events; and
- During the investigation of odour complaints to ascertain complainant's observations.

9.2.2 Sniff Testing

Sniff testing (sensory field odour assessment) is the most common form of odour monitoring and can provide evidence of an odour problem. Sniff testing will be undertaken in the following ways:

- As part of a daily inspection at the site boundary during normal operational conditions;
- At the site boundary during weather conditions that could contribute poor dispersion of odours; and
- At sensitive receptor locations if necessary (e.g. in the event of a complaint being received).

Sniff tests will be undertaken in accordance with Appendix 1 of the latest Environment Agency H4 Assessment (April 2011) and an example report form is attached in Appendix B.

Sniff testing will be completed by the CoTC/TCM using standard techniques. Locations will be selected around site boundary as appropriate and at the following sensitive receptor points:

a. Widmore Farm entrance;
b. Landfill site entrance from A421 to site boundary;
c. The Red Lion, Finmere;
d. Town Close and Primary School

e. T-Junction of Mere and Valley Road;
f. Church on Water Stratford Road;
g. T-junction at Hill Leys Farm; and
h. Kings Head Mini Garage.

9.2.3 Perimeter Ambient Monitoring for Fugitive Gases

Monitoring of potential fugitive releases will occur on a monthly basis in accordance with the landfill Environmental Permit requirements. Monitoring will be undertaken using a calibrated hand held FID device by a trained FID Operator and readings for methane and hydrogen sulphide will be taken at designated points.

Frequency of FID monitoring will be increased during:

- Periods when work is being undertaken that has a high risk of odour generation; and
- During periods of sustained complaints.

Monitoring will also take place at sensitive receptors during these periods.

9.2.4 Perimeter Borehole Monitoring

Monthly monitoring of perimeter gas boreholes will be completed by a trained operator/CoTC using calibrated hand held gas monitor in accordance with the landfill Environmental Permit requirements.

9.2.5 In-Waste Gas Monitoring

In-waste gas monitoring will be completed monthly in accordance with the landfill Environmental Permit by the Gas Contractor to ensure the gas field is operating correctly and is balanced. Adjustments will be made to engine/flare operations and extraction to ensure the gas field is balanced and extraction if effective.

9.2.6 Surface Gas Monitoring

Monitoring CH_4 will happen annually in accordance with the landfill Environmental Permit in the following locations:

- Permanently capped zone
- Temporarily capped zone
- Whole site
- Uncapped areas

Monitoring will be completed by an appointed competent monitoring consultant using TDL or similar assessment methodology.

In addition any cells or phases which have no active gas extraction installed will require monitoring of H_2S on a quarterly basis using a calibrated handheld monitoring instrument or Tedlar Bag sample in accordance with LFTGN04. This may be done by either site personnel or appointed monitoring contractor. Once gas extraction has commenced in a particular cell or phase then this monitoring can cease.

9.2.7 Jenbacher Generator Engine and Flare Exhaust

Monitoring for NO_X and total VOCs will on the gas engines and flares will be completed in accordance with the landfill Environmental permit.

9.2.8 Other Monitoring

The Operator may complete the following additional monitoring:

- Personal gas monitoring for machine operators or others (e.e. drillers, site inspection personnel, lining and capping contractors, etc) working on the tip. This monitoring will help flag any potential areas of concerns and will be followed up by FID monitoring as required.

- External monitoring consultants may be appointed during periods of sustained, justified odour complaints as determined by the Operator

9.2.9 Complaints Monitoring

The Operator recognises that complaints data is probably the most direct and reliable form of monitoring where odours beyond the site boundary are causing an annoyance. Therefore, the Operator will record complaints, respond to them and communicate with the complainants in accordance with the complaints procedure detailed below.

9.3 Complaints Procedure and Communication

9.3.1 Complaints Procedure

Complaints will be documented within the Site Log to ensure that odour complaints are handled correctly and systematically and acted upon.

The Operator will;

- Respond to odour complaints;
- Investigate odour complaints, take appropriate steps and actions and communicate with relevant stakeholders; and
- Communicate to appropriate bodies routinely and in response to any abnormal events or planned maintenance.

Regular olfactory monitoring of the MRF/landfill areas, installation boundary and community receptor as described in Section 9.1 will be carried out and recorded in the Environmental Log.

In the event that odour is detected at the installation boundary, at a designated community receptor or a complaint is received, additional monitoring at other sensitive receptors may be undertaken. When choosing the additional monitoring locations proximity of housing to the site, wind direction and/or complaint source shall be considered.

The additional monitoring shall record parameters using the rating system defined in section 8 which is as detailed in H4 Odour Management guidance.

In the event that odour is found to be causing a problem at the installation, as determined by off-site complaints or during routine monitoring, action will be taken to determine the source and the following courses of action as detailed below shall be taken as appropriate.

- If odour is due to material received, it will be removed from site or where this not practicable arrangements for immediate disposal at landfill and prompt burial will be made;
- Prevent further similar material being delivered to site
- Investigate the details of how and why the odour was caused
- Amend working practice to prevent reoccurrence

9.4 Reporting Results, Recording and Actions

9.4.1 Reporting Results and Monitoring

Records of all odour monitoring undertaken, as described in this OMP, will be maintained by the Operator. Monitoring results as stipulated by the Environmental Permits (EPR/FB3301CV or EPR/AB3908CZ) will be reported in accordance with the permit conditions.

Odour complaint reports will be reported to the EA in line with permit requirements (Permit section 3.3).

9.4.2 Recording

Records will be retained for a minimum of 6 years or as stipulated in the Environmental Permit.

9.4.3 Actions in the Event of Abnormal Emissions

In the event that daily odour monitoring indicates abnormal emissions from the facility are occurring, the site management team will implement the following actions:

- Check relevant items of odour control equipment in order to identify likely cause of abnormal emission;
- If possible, take immediate steps to eliminate the cause of the abnormal situation including contacting
- the maintenance operative if necessary - to obtain telephone support / advice or to request attendance on site; and
- Record response to abnormal emission and remedial action taken.

It should be noted that in extreme weather conditions (e.g. 50/100 year storm events which can cause significant changes in atmospheric pressure that in turn causes an extreme inversion event), the site will ensure that:

- There is greater operational presence through the storm event;
- That all systems are functioning fully;
- Liaise with the gas contractor to optimise gas extraction; and
- Increase frequency of odour monitoring.

However, there remains a potential for the inversion condition to continue as it will likely be outside both operator and equipment tolerance capabilities. Under these circumstances the Operator will liaise with the EA and the local community to advise controls in place to minimise odour emissions.

Appendix A Odour Risk Assessment

Operating Status	Odour Source	Most Sensitive Receptors	Likelihood			Control Measures	Mitigation Factor	Residual Risk	Action if odour causes problem	Responsibility
			Probability	Consequence	Risk					
Normal Operations	Delivery and weighing of incoming wastes	R1, R2, R3, R5, R8, R11, R14, R15	6	3	18	▪ Any waste deemed to be particularly malodorous will be rejected from the site. ▪ Rejected waste will be diverted directly to another landfill or further treatment elsewhere.	5	3.6	▪ Rejection of waste from site.	Weighbridge operator to make initial assessment.
	Unloading, handling, storage, pre-treatment, treatment and loading of incoming wastes	R1, R2, R3, R5, R8, R11, R14, R15	6	3	18	▪ Storage of incoming waste for the MRF will be for up to 3 days for paper, glass and plastics, up to 30 days for metal and before the end of each day for putrescible waste. ▪ Storage of metals from the MRF will take place externally in separate skips or stockpiled within the MRF. ▪ Good housekeeping standards will ensure that the site areas are kept clean to prevent build-up of spillage waste. Wheel washing shall be employed if necessary.	5	3.6	▪ Reject or isolate and transfer malodourous waste as soon as possible to disposal or further treatment. ▪ Review housekeeping procedures. ▪ Review handling procedures.	Operator to ensure unloading, handling, storage and loading procedures are adhered to.
	Discontinuous odour sources - Compaction, shredding, handling of waste in the MRF and landfill	R1, R2, R3, R5, R8, R11, R14, R15	6	3	18	▪ Check the waste to be processed in the MRF is not likely to give off malodorous emissions. ▪ The processing of waste by mechanical means should be closely monitored and works should cease if the odour levels become elevated. ▪ Odour neutralisers should be deployed in the facility and on the landfill. ▪ Staff in close proximity to the wastes should wear appropriate PPE to mask the potential and present odours. ▪ Clean down facility regularly and ensure that putrescible waste is not left overnight.	5	3.6	▪ If it is likely the waste will give off malodorous emissions, then consider not processing it or reject the load. ▪ Review housekeeping procedures. ▪ Reduce shredding speed or stop machinery. ▪ Review met office data on a continuous basis. If the weather changes or wind direction, then you should reassess the effectiveness of the odour neutralizers (adjust direction with prevailing wind).	CoTC to ensure odour is not excessive
	Tipping area / work face	R1, R2, R3, R5, R8, R11, R14, R15	6	3	18	▪ Tip in as small area as possible and apply cover as soon as possible. ▪ Prevent vehicles full of waste from parking overnight. ▪ Ensure odour neutralizers are in good working order throughout tipping operations.	5	3.6	▪ Stop or stagger tipping operations if the odour is deemed to be excessive. ▪ Redirect odour neutralizers downwind of tipping area.	CoTC to ensure odour is not excessive
	Landfilling operations (adding covers)	R1, R2, R3, R5, R8, R11, R14, R15	6	3	18	▪ Following design requirements adding cover to an area at the secession of daily landfilling operations. ▪ Following design requirements adding intermediate cover where tipping will not occur for 7 days or more. ▪ Following design requirements adding a temporary cap or permanent cap if the cell is filled.	5	3.6	▪ Ensure that the cover is sufficient depth according to the design requirements. ▪ Daily cover should be added promptly to reduce odour emissions and vermin. ▪ Consider relooking at the landfill design. ▪ Considering adding additional support to flanks with geomembrane	CoTC to ensure odour is not excessive
	Management of leachate	R1, R2, R3, R5, R8, R11, R14, R15	6	2	12	• Leachate will collect within the site drainage system and be directed to the leachate tank to be exported off site.	5	2.4	▪ More frequent collection of leachate to be exported off site.	CoTC to ensure odour is not excessive

Operating Status	Odour Source	Most Sensitive Receptors	Likelihood			Control Measures	Mitigation Factor	Residual Risk	Action if odour causes problem	Responsibility
			Probability	Consequence	Risk					
						• Leachate will be collected on a regular basis to reduce stagnation.				
Abnormal Conditions	Delivery of large volume of incoming waste over a short period of time	R1, R2, R3, R5, R8, R11, R14, R15	2	4	8	The Operator will exercise the following with regards to their waste suppliers: ▪ Define maximum tonnages that can be accepted on a daily basis; ▪ Agree delivery schedule with consideration of public holidays; ▪ Stipulate the remit for the rejection of wastes if the facility is over supplied and daily recording of quantity of waste accepted into facility; ▪ Contingency plan for management of over-supply of waste, including possible diversion to other facilities to accept rejected loads and options to return to supplier.	5	1.6	▪ Rejection of wastes and implementation of contingency plan.	Management team to negotiate supplier policy and contingency plan Weighbridge operator to record quantity of waste accepted daily. Competent person to decide if waste should be rejected and whether it should be returned to supplier, sent to another licensed waste facility or disposed of direct to landfill.
	Delivery of malodourous waste	R1, R2, R3, R5, R8, R11, R14, R15	3	4	12	▪ Weighbridge operative to identify malodourous waste. Load to be rejected. ▪ Plant operative to identify delivered malodourous waste. Malodourous waste to be reloaded onto delivery vehicle or isolated and prioritised for onward transport to disposal facility.	5	2.4	▪ Waste rejected at the weighbridge. ▪ Waste rejected upon discharge and reloaded on to delivery vehicle for off-site disposal. ▪ Waste isolated and prioritised for onward transport to disposal facility.	Competent persons as weighbridge operator and plant operative.
	Plant and equipment malfunction / breakdown	R1, R2, R3, R5, R8, R11, R14, R15	2	4	8	▪ Planned preventative maintenance and regular inspections. ▪ Availability of maintenance operatives - could be on site within a few hours. ▪ Stand by parts / equipment to be available	5	1.6	▪ Repairs to be undertaken as quickly as possible.	Competent person to ensure plant / equipment is repaired as quickly as possible
	Unusual weather conditions e.g. extreme atmospheric temperature, extreme wind turbulence	R1, R2, R3, R5, R8, R11, R14, R15	3	4	12	▪ Meteorological information / forecasts received from the onsite met station and UK Met Office. ▪ Job planning to mitigate the impact of unusual weather conditions.	5	2.4	▪ Monitor odour emissions using site procedures. ▪ Assess the effectiveness of the odour neutralizers used on site. (adjust direction with prevailing winds / consider deploying more) ▪ Review site procedures in relation to weather conditions to establish if modification will mitigate odour emissions.	Competent person to ensure meteorological information / forecast is reviewed daily. Competent person to exercise monitoring procedures.
	Closure of landfill or treatment facility preventing transfer of putrescible fraction waste from facility	R1, R2, R3, R5, R8, R11, R14, R15	1	4	4	▪ Alternative disposal sites to be identified and used when necessary. If no alternative site available waste acceptance will be ceased.	4	1	▪ Use alternative disposal sites	Competent person to identify and authorise the use of alternative disposal sites.

Operating Status	Odour Source	Most Sensitive Receptors	Likelihood			Control Measures	Mitigation Factor	Residual Risk	Action if odour causes problem	Responsibility
			Probability	Consequence	Risk					
	Excessive Landfill gas produced from landfill.	R1, R2, R3, R5, R8, R11, R14, R15	1	5	5	▪ Regular venting of LFG. ▪ Regular monitoring, maintenance and repair of gas infrastructure. ▪ Consider installing more gas infrastructure (pumps/blowers).	4	1.25	▪ Flaring of LFG may be increased as a safety measure. ▪ Consider adding gas pre-treatment to the utilisation to remove possible siloxanes and other pollutants.	Competent person to identify and authorise the use of alternative disposal sites.
	Landfill fires	R1, R2, R3, R5, R8, R11, R14, R15	1	6	6	▪ Prevent air being drawn into the landfill from unsealed areas. ▪ Ensure sufficient landfill cover is applied daily. ▪ Monitor for fires and ensure sufficient LFG is vented off. ▪ Low level LFG suction to be applied from the utilisation plant.	4	1.5	▪ OPES MRF 2013 Ltd Operations Manager to inspect source of smoke and to inform RPS Operations Manager who shall arrange for monitoring of CO and temperature in surrounding gas wells ▪ OPES MRF 2013 Ltd to inform Environment Agency Inspector.	Competent person to identify fire and whether it is deep seated.
	Fire at the MRF	R1, R2, R3, R5, R8, R11, R14, R15	1	5	5	▪ Control amount of ignitable material being stockpiled ▪ Have fire retardant divisions in place to segregated at flammable recyclates / materials.	4	1.25	▪ Ensure the fire is put out by emergency services as soon as possible. ▪ Remove other ignitable material from source of fire. ▪ OPES MRF 2013 Ltd to inform Environment Agency Inspector.	Competent person to identify fire and other ignitable material.

Appendix B Landfill Operational Controls

LANDFILL ODOUR CONTROL

Risk Area	Odour Release Point	Potential Outcome	Possible Failure/Abnormal Situation	Control Measure	Contingency Measure	Responsibility	Approximate Time to Instigate	Notification/Recording
Waste Acceptance	• Refuse Collection Vehicle (RCV) • Active Face	• Area and Point source release of waste odour • Odour detection at permit boundary • Odour detection outside permit boundary	• Receipt of potentially high odorous waste • Delay at WTS/Roadside due to bank holiday • Loads not deemed to be odorous at quotation stage containing odorous material	• Wastes identified at the client quotation stage as difficult due to their odorous nature shall not be accepted for disposal. • Non-intrusive inspection at the weighbridge - operator will advise the plant operatives of the arrival of any high odour risk waste so that appropriate preparations to receive the waste can be made at the operational area. • consult residents on preferred smell for odour units	As per Low Odour Waste Procedure WML/01	TCM/TCP	<1 hour	Waste Acceptance Records
Waste Placement In Active Cells	Placement of Materials	• Area and Point source release of waste odour • Odour detection at permit boundary • Odour detection outside permit boundary	• Fugitive release of Gas from normal operations • Tracked excavator out of service • Malodorous waste received	• Manage the size of active area. • Compaction of waste as placed	Minimize size of active area	TCM/TCP	1 Hour	Site daily log
					High odour risk waste will be deposited in front of the working face and will be covered immediately by other non-malodorous waste materials.			
					Progressive compaction of waste throughout the operational day	TCM/TCP	1 Hour	
	Daily Cover /	• Area and Point source release of waste odour • Odour detection at permit boundary • Odour detection outside permit boundary	• Fugitive release of Gas from normal operations • Gas balance allowing fugitive release of Gas • Daily cover washed/blown off • No daily cover available • Tracked excavator out of service	• Daily Cover of an average depth of 0.2m using appropriate cover materials. • Installation of sacrificial scavenger lines at every 15m of waste height • Fortnightly balancing of gas field • Dampen down • Checking daily cover stock pile levels at least weekly to ensure adequate volumes available. Advise the Commercial Team if additional materials required. • Regular maintenance	Alternate daily cover material sourced such as onsite material, hessian or similar.	TCM/TCP	- 1 week	Log on any changes to daily cover on the site inspection log
					Consider change in type of cover material	TCM/TCP	1-2 days	
					Increase daily cover or change the type of cover material.	TCM/TCP	1 day	
					Review gas extraction coverage, and install additional pin wells if necessary	- GTE	- 1 week	Review gas extraction coverage, and install additional pin wells if necessary
	Intermediate cover	• Area and Point source release of gas odour • Odour detection at permit receptors • Odour detection outside permit boundary	• Elevated methane levels detected • Intermediate cover washed/blown off • Gas balance allowing fugitive release of Gas	• Monthly surface monitoring (FID walkover and visual inspection) of intermediate cover and temporarily capped areas • Fortnightly balancing of gas field in accordance with the GMP.	Increase cover if found to be ineffective	TCM/TCP	- 1 week	Log on any changes to intermediate cover on the site inspection log
					Apply additional cover if found to be below 200mm / ineffective	TCM/TCP	1 week	
					Review gas extraction coverage, and install additional pin wells if necessary	- GTE	- 1 month	
Non-active cells	Temporary Cap	• Area and Point source release of gas odour • Odour detection at permit receptors • Odour detection outside permit boundary	• Elevated methane levels detected • Temporary cap damaged • Gas balance allowing fugitive release of Gas	• Temporary capping is applied to area that are to be non-operational for a month or more. Temporary capping consists of 0.5m soil/clay or a suitable membrane. • Avoid building up layers of impermeable material as this may impede movement of landfill gas. • Wherever possible, measures will be taken to ensure that previously emplaced waste is not disturbed, exposed or moved. • Monthly surface monitoring (FID walkover and visual inspection) of intermediate cover and temporarily capped areas – frequency to be increased in event of odour complaints.	Apply additional temporary capping materials or alternative membrane if found to be unsuitable	- Site Manager	- 1 week	Log on any changes to temporary cap onsite inspection log
					Apply additional cover if found to be below 200mm / ineffective	TCM/TCP	1 week	
					In the event that it is disturbed, (e.g. during the installation of gas and leachate wells), it will be removed and buried at the earliest opportunity.	TCM/TCP	1 day	
					Review gas extraction coverage, and install additional pin wells if necessary	- GTE	- 1 week	

Risk Area	Odour Release Point	Potential Outcome	Possible Failure/Abnormal Situation	Control Measure	Contingency Measure	Responsibility	Approximate Time to Instigate	Notification/Recording
				• Fortnightly balancing of gas field				
	Permanent Cap	• Area and Point source release of gas odour • Odour detection at permit receptors • Odour detection outside permit boundary	• Fissures in the CAP • Ineffectively sealed wells • Gas balance allowing fugitive release of Gas	• Installation of containment cap subject to CQA • Monthly gas monitoring at boundary. Full cap annually. • Wherever possible, measures will be taken to ensure that previously emplaced waste is not disturbed, exposed or moved. • Fortnightly balancing of gas field	Remediation of Cap and re-survey	TCM/TCP	1 to 2 weeks	EA to be notified of any changes from approved CQA plan approach
					Re-seal wells, and re-monitor to check the repairs have worked.	TCM/TCP	1 week	
					In the event that it is disturbed, (e.g. during the installation of gas and leachate wells), it will be removed and buried at the earliest opportunity.	TCM/TCP	1 day	
					Re-balance Gas field	- GTE	- 1 week	
Gas Management	Gas Infrastructure	• Area and Point source release of gas odour • Odour detection at permit receptors • Odour detection outside permit boundary	• Damage to pipes	• Fortnightly inspection of Gas field • Monthly gas monitoring at boundary. Full cap annually. • Maintain essential spares and equipment on site • Operatives / contractors inducted on accident avoidance, action and reporting procedures	Temporary repair / alternative to maintain extraction followed by permanent repair	- GTE	-1-3 days	Any failure of extraction system to be reported to EA in line with Schedule 5 requirements
					Re-balance Gas field	- GTE	-1 day to 1 week	
	All areas under gas extraction)		• Failure of extraction (Blowers) • Planned maintenance of blowers	• Inspection of gas compound every twice weekly. The system has an automated dial out facility in the event of a problem. As defined in GMP. • Duty and standby blowers can be maintained separately • Maintain essential spares and equipment on site • Plan maintenance to not be carried out in un favourable meteorological conditions where possible • Site will carry out odour monitoring off site while maintenance is taking place.	Repair blowers using on site personnel. Specialist personnel. Contractors.	GTE/Specialist contractors	2 days to 2 weeks	Residents to be advised if potentially odorous situation for >1 day Any breakdown blowers to be reported to EA in line with Schedule 5 requirements
					On site temporary flare and blower could be used if required.	- GTE	1 - 2 days	
					Deployment of extra odour suppression units	TCM/TCP	-1 to 2 days	
					Review maintenance procedure for future occurrences	TCM/TCP/GTE		
	All areas under gas extraction)		Loss of power	• 24 hr dial out, GTE to respond next day . – • Flare will automatically restart following a power outage. • Generator uses diesel, stock available on site. GTE maintenance check sheet for the compound. The generator powers engines & flare	Back -up generator failed. Arrange for mobile generator to be brought to site. As per the contract with the power company.	- GTE	1 day	Residents if required Any breakdown of generator which causes loss of engine and flares to be reported to EA in line with Schedule 5 requirements as there is potential for odour/gas release
					Consider restricting waste inputs until the gas extraction/odour suppression system is up and running again.	TCM/TCP/GTE	1 day	
	Gas Engines		• Failure of engines • Planned maintenance of engines	• Divert gas to Flares - maintain enough flare capacity that full extraction can be maintained should engines fail. Automatic dial out • Regular inspections and maintenance • Maintain essential spares and equipment on site •	Repair engines	GTE	1 day	Residents if required Any breakdown or trip of engines with potential for odour/gas release (eg flare not operational) o be reported to EA in line with Schedule 5 requirements
					Use of on-site flares and blower.			
	Flare		• Failure of flare (s) • Planned maintenance of flare	• Divert gas to engines and ensure 2nd flare is operational • Plan maintenance to not be carried out in un favourable meteorological conditions where possible	Repair flare	GTE	1 day	Residents if required Any breakdown or trip of flare to be reported to EA in line with
					Use of on-site temporary flare and blower.	GTE	1 hours	

Risk Area	Odour Release Point	Potential Outcome	Possible Failure/Abnormal Situation	Control Measure	Contingency Measure	Responsibility	Approximate Time to Instigate	Notification/Recording
				• Maintain essential spares and equipment on site				Schedule 5 requirements
Gas Release from disturbed waste	Disturbed waste	• Area and Point source release of gas odour • Odour detection at permit receptors • Odour detection outside permit boundary	• In waste gas well installation (normal activity) • Incomplete wells not sealed • Abandoned wells not sealed	• Operations timed with regard to meteorological conditions and sensitives times (holidays) • Contract specification requires that all wells are sealed at the end of the working day • Abandoned holes are sealed with bentonite as per generic GMP • Audit of operatives compliance with specification .	Frequent gas field balancing	GTE	As required	EA and Residents if required
					Deployment of extra odour suppression units	GTE	-1 to 2 days	
					Review procedure for future occurrences	TCM/TCP/GTE		
Engineering Activities	Tie in between new cell and previous cells	• Area and Point source release of gas odour • Odour detection at permit receptors • Odour detection outside permit boundary	• Engineering of the interface between cells – applicable for future cells and restoration stages as new cells ultimately tie in with historic cells. • Exposure of Drainage blanket • Cutting back into old waste • Exposed leachate drainage layers	• Reference to approved QCA plans • Agree site specific procedure with Contractors to undertake the works. .	• Review the CQA plan or site specific procedure if required.	TCM/TCP	As required	EA to be notified of any changes from approved CQA plan approach
Leachate Management	Leachate infrastructure	• Area and Point source release of gas odour • Odour detection at permit receptors • Odour detection outside permit boundary •	• Minor Leachate breakout • Damage to extraction infrastructure • High leachate head	• All leachate extraction wells and monitoring points will be fitted with a cap or bullet to minimise potentially odorous emissions. • Monthly walkover of the capped areas. • Operatives / contractors inducted on accident avoidance, action and reporting procedures • Monthly monitoring of leachate levels	Application of cover material to spill area	TCM/TCP	- 1 to 5 hours	Any significant loss of leachate to be reported to EA in line with Schedule 5 requirements
					Temporary / permanent repair	TCM/TCP	- 1 hour	
					Leachate Management Plan & Leachate Action Plan	TCM/TCP	1 hour	
	Leachate storage		• Storage tanks (venting) • Leak from tank	• Proprietary storage tanks equipped with level detection and alarms, pressure relief protection and integral containment at 110% of tank volume. • Tanks located on impermeable concrete. • Tanks are subject to planned preventative maintenance. • Tanks are inspected daily as part of site inspection to ensure no leaks.	Leachate soaked up with sand/soil in accordance with Site Emergency Response Procedures	TCM/TCP	<1 hour	Daily site inspection. Maintenance logs Any significant loss of leachate to be reported to EA in line with Schedule 5 requirements
	Leachate export		• Odour from small spill of leachate from tanker loading or bowser discharging.	• Tanker loading and discharge procedures refer. Requires constant supervision of loading /discharge. • Sump in discharge area pumps leachate to tank 1 • Sand/spill kit material kept on site	Leachate soaked up with sand/soil in accordance with Site Emergency Response Procedures	TCM/TCP	<1 hour	Spills to be recorded in site daily log. Any significant loss of leachate to be reported to EA in line with Schedule 5 requirements

Appendix C Action for Abnormal Operations

SITE ABNORMAL ODOUR RESPONSE PLAN

Abnormal Event	Control Measure	Action If Odour Caused	Responsibility
Delivery of malodorous waste	• Weighbridge operative to identify malodourous waste. Load to be rejected in line with waste acceptance procedures. • Plant operative to identify delivered malodourous waste. Malodourous waste to be reloaded onto delivery vehicle or isolated and prioritised for onward transport to disposal facility.	• Waste rejected at the weighbridge • Waste rejected upon discharge and reloaded on to delivery vehicle for off-site disposal. • Waste isolated and prioritised for onward transport to disposal facility. • Discuss with the waste producer the possibilities of containing the waste in bags or other receptacles prior to landfill disposal. • Where it is not practicable to remove waste immediately then alter the operational procedures to ensure the waste is immediately buried and covered with other waste. • Utilise odour-masking sprays to hide the offensive smell. • Terminate the acceptance of the malodorous waste if corrective measures to contain odour cannot be implemented by the waste producer.	Site Manager / Competent persons as well weighbridge operator and plant operative.
Plant and equipment malfunction or break down	• Planned preventative maintenance and regular inspections. • Availability of specialist maintenance contractors. • Stand by parts / equipment are available	Repairs to be undertaken as quickly as possible, hired plant delivered to site or equipment replaced	Site Manager / Competent person to ensure plant / equipment is repaired as quickly as possible
Electrical failure	Emergency procedures.	• Operations will carry on as normal unless odour control measures and/or the safety of persons are compromised. • If operations have to cease, customers will be notified immediately to divert vehicles from site and the Environment Agency will be notified by telephone and updated accordingly.	Site Manager / Competent Person

Abnormal Event	Control Measure	Action If Odour Caused	Responsibility
Unusual weather conditions (extreme temperature)	• Meteorological information / forecasts received from the Met Office. • Task planning to mitigate the impact of unusual weather conditions. • Offsite monitoring	• Monitor odour emissions using site procedures. • Review site procedures in relation to weather conditions to establish if modification will mitigate odour emissions.	• Competent person to ensure meteorological information / forecast is reviewed daily. • Competent person to exercise monitoring procedures.
Unusual weather conditions (extreme pressure events)		▪ Ensure there is greater operational presence through the storm event; ▪ Ensure that all systems are functioning fully; ▪ Liaise with the gas contractor to optimise gas extraction; and ▪ Increase frequency of odour monitoring in line with site procedures..	
Inadequate cover or capping	Waste Placement Procedure	• Additional cover will be applied to the problem area and if the area is awaiting capping, this will be carried out as soon as practicable. • Utilise odour-masking sprays pending completion of remedial work.	Site Manager / Competent Person
Inadequate gas control	Gas Management Plan (GMP)	• A comprehensive audit on the gas system to ensure its integrity and effectiveness. • Repairs to or replacement of any malfunctioning infrastructure for example pipelines, wellheads, dewatering pots etc. • Installation of additional gas wells. • Review and update the GMP as appropriate • Utilise odour-masking sprays pending completion of remedial work.	Site Manager / Competent Person / Gas Contractor
Issues with leachate infrastructure (i.e. tanks, wells & pipework	Leachate Management Plan (LMP)	• Additional seals may be applied to problematic wells and monitoring points. • Alternative methods of leachate pumping which reduce exposure of the leachate to the atmosphere, will be considered. • Fitting of filters or scrubbers to the leachate storage tanks will be considered.	Site Manager / Competent Person / Leachate Contractor

Abnormal Event	Control Measure	Action If Odour Caused	Responsibility
		• Utilise odour-masking sprays pending completion of remedial work.	
Disturbed waste	• EA and local community will be pre-notified of any planned work which may involve disturbing previously deposited waste. • Method statements to be developed by contractors for proposed activities to include defined odour controls.	• Additional odour-masking sprays to be deployed. • Monitoring of meteorological conditions - action will be taken to bury the waste or terminate drilling or excavation operations until favourable conditions prevail.	Site Manager / Competent Person/Contractor
Closure of disposal outlets	Contingency outlets available	Outlets will be notified and material will be diverted	Site Manager / Competent Person
Flood	Emergency procedures.	• Suspension of waste acceptance in the event of a flood warning and if site cannot resume normal operations. • If flooded, existing stock of waste that is likely to cause an odour will be removed by articulated bulk vehicles once it is safe to do so.	Site Manager / Competent Person
Staff availability	Site staffing procedures and ongoing business reviews	If there is insufficient staff to implement the actions in the odour management plan whilst processing waste, then the site will have to limit the vehicles allowed to on site until extra staff are sourced.	Site Manager / Competent Person

Appendix D Example of Reporting Form

Odour report form					Date
Time of test					
Location of test e.g. street name etc					
Weather conditions (dry, rain, fog, snow etc):					
Temperature (very warm, warm, mild, cold, or degrees if known)					
Wind strength (none, light, steady, strong, gusting)					
Wind direction (e.g. from NE)					
Intensity (see below)					
Duration (of test)					
Constant or intermittent in this period					
What does it smell like?					
Location sensitivity (see below)					
Is the source evident?					
Any other comments or observations					

Sketch of Odour Monitoring Locations/Potential Odour Sources	↑	**N**

Intensity (Detectability)	**Location sensitivity where odour detected**
1 No detectable odour 2 Faint odour (barely detectable, need to stand still and inhale facing into the wind) 3 Moderate odour (odour easily detected while walking & breathing normally) 4 Strong odour 5 Very strong odour (possibly causing nausea depending on the type of odour)	0 not detectable 1 Remote (no housing, commercial/industrial premises or public area within 500m) 2 Low sensitivity (no housing, etc. within 100m of area affected by odour) 3 Moderate sensitivity (housing, etc. within 100m of area affected by odour) 4 High sensitivity (housing, etc. within area affected by odour) 5 Extra sensitive (complaints arising from residents within area affected by odour)