



**Valencia**

# **ODOUR MANAGEMENT PLAN**

Shelford Landfill

**Environmental Permit Ref: XP3434HX**

Shalloak Road, Canterbury CT2 0PU

26.04.2023

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### 1. Objectives

This document outlines the methods by which Valencia will systematically assess, reduce, and prevent potentially odorous emissions from Shelford Landfill in accordance with condition 3.3 of Permit XP3434HX.

It sets out what Valencia deems to be appropriate measures for routinely mitigating off-site odour taking into consideration operational activities on a situational basis. This odour management plan serves to aid the decision-making process on the choice of controls, general site design, and operational practice in line with current industry best practice. Where additional risks are identified Valencia will review the necessity for any additional measures and implement them accordingly.

This plan sets out to ensure that:

- Permit Condition 3.3 is complied with;
- all potential odour sources are identified;
- odour impact is considered as part of routine inspections;
- odour is primarily controlled at source by good operational practices, the correct use and maintenance of plant, and operator training;
- all appropriate measures are taken to prevent or, where that is not reasonably practicable, to minimise odorous emissions to air from the installation that may be considered offensive at locations outside of the installation boundary;
- any issues that have the potential to result in off-site odour are addressed promptly;
- where reasonably practical, people outside of the site are not exposed to levels of odour that would result in annoyance;
- the risk of unplanned odour releasing incidents or accidents that would result in annoyance is minimised; and
- site developments take into account odour potential and potential impacts from work carried out.

This document has been compiled with specific regard to on-going waste operations at the site and to the general operational management and development of the site. When approved, this revised document will supersede all previous OMPs and will form part of Valencia's Integrated Business Management System (BMS).

This document has been prepared by Valencia's Landfill Compliance and SHEQS Teams. This plan draws upon Valencia's national standards for production and issue of OMPs for landfill facilities across the UK, which have been reviewed and updated in 2013 in addition to the experiences gained in the effective control of landfill odour from 2009 to present at key sites in the Company's portfolio.

## 2. **Key Reference Documents**

The methodologies presented take account of Environment Agency (EA) guidance documentation, as detailed below:

- EA Technical Guidance Note H4 Odour Management (March 2011)
- EA Internal Guidance for the Regulation of Odour at Waste Management Facilities (version 3.0)
- EA Guidance on Odour Management Plans for Waste Handling Facilities (v1.0, 2010)
- LFTGN 07: Guidance for Monitoring Landfill Gas Surface Emissions (v2, 2010)
- LFTGN 03: Guidance on the Management of Landfill Gas (v1, 2004)
- LFTGN 04: Guidance for Monitoring Trace Components in Landfill Gas (v3, 2010)
- Environment Agency Guidance for the Landfill Sector S5.02 (withdrawn)
- Landfill operators: environmental permits (<https://www.gov.uk/guidance/landfill-operators-environmental-permits>)
- The Environmental Permitting (England and Wales) Regulations 2016
- Regulating odour – a quick guide (163\_12)
- Odour Regulation FAQ (Quick Guide 380\_12)
- EA Guidance on How to comply with your environmental permit (v6, Document 433\_11) (withdrawn)
- Develop a management system: environmental permits (<https://www.gov.uk/guidance/develop-a-management-system-environmental-permits>)
- Control and monitor emissions for your environmental permit (<https://www.gov.uk/guidance/control-and-monitor-emissions-for-your-environmental-permit>)

Additional information is set out in the following documents, further references are included through this plan to internal Valencia documents:

- Valencia Integrated BMS requirements;
- Shelford Landfill Gas Management Plan (GMP) - Version 5.1
- Valencia Gas Operating Standards Manual Version 5.0.

## 3. **Site Environmental Setting**

### 3.1 **Installation Details**

Shelford Landfill Site is located approximately 2 km north-east of Canterbury, at National Grid Reference (NGR) TR 159 603. The immediate surrounding land to the north and east is predominately agriculture whereas land to the west beyond surrounding fields is predominately residential. The land to the immediate south is industrial/commercial including a sewage treatment works and a household waste recycling centre, and a train line forms part of the site boundary.

### 3.2 **Pathway Assessment**

Local meteorological data has been obtained from Manston observing station which is 17.7 km due east of the landfill site and represents the nearest appropriate observing station. For the

period 2019 to 2021 meteorological data has been used to qualify the frequency of wind speed and direction. The predominant wind direction is from the south-west and south-south-west, occurring 31% of the time. Winds from the north-north-east, north-east, south, west-south-west, west and west-north-west also occur over 5% of the time each.

### 3.3 Potential Receptor Locations

Review of the site's environmental setting has highlighted potentially sensitive off-site receptors with regards to any odorous emissions arising from the Shelford Landfill Site, as follows:

Receptor	Type of receptor	Distance from site boundary (m)	Direction from site	Downwind frequency (%)	Topographical relation to site	Complaint history	Sensitivity
Hales Place	Residential	170	WSW - SSW	16	Downhill, typical 10% gradient with a small valley between site and the receptor. The receptor is located on a downwards slope that extends beyond the area.	Medium	High
Shalloak Road	Residential Commercial	210	NNE - SE	55	Road rises by typically 5% gradient although is not confined by any valley features. A 25m valley feature lies between the landfill and the receptor.	Medium	High
Broad Oak Road/ Sturry Road	Residential Commercial Industrial	175	SE - SW	25	Receptor is situated on a level area of land with the landfill rising above at approximately a 10% gradient	Medium	High
Sturry	Residential Commercial	1,000	NE - SE	41	Receptor is situated on a level area of land below the elevation of the landfill	Low	Low
Broadoak	Residential	475	NNE - NE	31	Receptor is located at the top of a hill, broadly on the same elevation as the site	Medium	High
Properties to northwest of site	Residential	375	NW	5	Receptor is separated from the site by an area of elevated land	Low	Low
Fordwich	Residential	1,350	ESE	5	Receptor is situated on a level area of land below the elevation of the landfill	Low	Low
University of Kent	Residential	1,250	W - WSW	6	Receptor is located on elevated land	Low	Low

[1] Receptor potential sensitivity has been subjectively assessed based on proximity to site, prevailing local weather conditions, topography, and associated complaint history.

A plan showing the site's environmental setting and high sensitivity off-site receptor locations is included as Appendix 2.

#### **4. Site/Process Description**

##### **4.1 Site Layout Plan**

A layout plan of Shelford Landfill is included as Appendix 1.

##### **4.2 Process Description**

Shelford Landfill is a fully engineered and contained landfill facility operating to the highest environmental standards. The site is classified as a non-hazardous waste landfill and accepts a wide range of municipal and industrial and commercial wastes.

All landfill cells in Phases 1-15 benefit from an engineered containment system. Construction of each phase has been agreed with the Environment Agency through a Construction Quality Assurance (CQA) plan and a subsequent CQA validation report.

Tipping commenced in Phase 9/2 in September 2020.

An active gas management system has been progressively installed at the landfill comprising a network of vertical and horizontal gas extraction wells, connected to a carrier main. The gas collection system, which has expanded as the landfill has developed, carries gas to the landfill gas utilisation plant (GUP) for electricity generation, which is exported to the local high voltage electricity network. Any gas that is not utilised in the engine generator sets is combusted in a high temperature flare. The plant is located to the southeast of the landfill site.

An engineered leachate management and extraction system has also been progressively installed at the site comprising a network of vertical sumps and remote monitoring points in each phase. A dedicated leachate treatment plant (LTP) has been constructed to the southeast of the site. Extracted leachate is transferred to the LTP for biological treatment prior to sewer discharge in accordance with the site trade effluent discharge consent.

A landfill Directly Associated Activity waste validation bay is utilised Storage and sorting of waste to remove contraries and to minimise the area of exposed tipping face at any time. This in turn reduces fugitive emissions from the exposed tipping face. The validation bay is located on a sealed surface with contained drainage. An odour suppression system is also available if required.

Shelford MRF pre-treatment for incineration, recycling and residual landfill deposit is operated in the south east of the permit boundary area. The MRF is not intended to process putrescible waste, it is predominantly intended for recoverable elements of commercial and industrial wastes.

Site operational hours are:

- Monday to Friday, 07:15 to 17:00
- Saturday 07:15 to 12.00 – when required
- Sunday – Closed to incoming waste
- Bank Holidays – 07:15 to 17:00 – when required by KCC

#### **5. Landfill Odour Controls**

In line with current industry best practice, the odour controls set out in the sections below will be used as the 'appropriate measures' to minimise and, wherever possible, prevent odour associated with site operations at Shelford Landfill.

##### **5.1 Overarching Management Responsibility**

The General Manager has responsibility for ensuring that potentially odorous emissions arising from the installation are minimised. Adequate staffing levels will be maintained at all times to

ensure the effective operation of the facility.

Site meetings will be held at minimum monthly intervals for site management to discuss current and planned site operations with respect to their potential for generating odorous site emissions. Identified actions arising from the meetings and responsibilities for their completion will be reviewed by site management.

### 5.2 Identification of Potential Odour Sources

In constructing robust risk-based management protocols for the site, it is recognised that there are four primary potential odour sources associated with operations at Shelford Landfill site:

- i. those from active waste disposal operations and the deposition of freshly tipped waste (Sections 4.3 – 4.11);
- ii. those from ‘old’ waste that may be released from drilling or over-tip operations (Section 4.12);
- iii. landfill gas (LFG) arising from the decomposition of waste (Sections 4.13 – 4.15); and
- iv. leachate, if present on the surface of the site or where stored in structures (Sections 4.16 – 4.17).

These matters are addressed further in the relevant sections below together with a description of the site’s active odour control measures and protocols.

### 5.3 Waste Feedstock Inventory

Having due regard to the potential for waste feedstock material to be inherently odorous, key waste streams received at the site are detailed below. The odour potential typically associated with individual waste streams as received on-site under ‘normal’ operational conditions is also provided below based on subjective odour assessment and operational knowledge of the waste material properties.

**Table 1 – Waste Feedstock Inventory**

	Waste Type	Odour Potential (Low, Moderate, High, Very High)
1.	Mixed industrial/commercial waste	Moderate
2.	Mixed industrial/commercial waste from other local TSs	Moderate
3.	Civic amenity waste	Low
4.	Household waste	Moderate
5.	Soil material	Low
6.	Cat 1 Food waste	High
7.	Papermill rejects	Moderate
8.	Restoration Material	Low

The odour potentials set out in Table 1 will be routinely reviewed by the site management team in order to take account for possible variations from the established trends.

Waste feedstocks other than those listed in Table 1 may be accepted on occasions, provided that they are set out in Schedule 2 of the Permit, and will be assessed for odour on an individual basis.

### 5.4 Waste Storage and Transport

It is recognised that the waste feedstock odour potential set out in Table 1, above, may be significantly affected by the age of the waste when it is received at the site. The General Manager will liaise with the waste producers and transport contractors to minimise the storage and transport periods for waste prior to being delivered to the site.

### 5.5 Disposal of Potentially Higher Odour Risk Waste Streams

Site management will liaise with a customer prior to the arrival of a load containing high odour risk waste. Site management will then liaise with the weighbridge operator to relay any important information regarding the load. The weighbridge operator will advise the plant operatives of the arrival of such waste so that appropriate preparations can be made to receive it at the operational area. This process will be done in accordance with the site's 'non-compliant waste' and 'odour' UEPs. The waste will be moved promptly from the MRF or validation bay and deposited in front of the working face and covered by other non-malodorous waste materials.

### **5.6 Particularly Odorous Waste**

In the event an existing or new waste stream is identified as being of a highly odorous nature and likely to cause prolonged nuisance at locations beyond the site boundary, the waste will not be accepted at the site. This assessment will be made based on subjective review by the site management of any new waste stream's odour potential prior to receipt at the site in addition to the results of routine subjective odour surveys undertaken in and around the site boundary (see Section 5, below).

### **5.7 Plant and Equipment**

The General Manager will ensure that sufficient plant and equipment is maintained on the operational area of the landfill to adequately place, compact, and cover all delivered waste in a progressive manner.

### **5.8 Compaction of Waste**

The progressive compaction of the waste during the working day using mobile compaction equipment will be used to assist in the prevention of odours. The active area and tipping face size will reflect operational requirements and will be minimised to reduce the pathway for odorous emissions.

### **5.9 Application of Cover Material**

The General Manager will ensure that there are adequate supplies of cover material available at the installation. A layer of cover material (typically soils) will be applied to the deposited waste in a progressive manner throughout the day in order to ensure the waste is adequately covered. The integrity of cover will be routinely inspected by site management and maintained where required.

### **5.10 Progressive Capping of Completed Areas**

Completed areas of the installation will be capped with an engineered clay and/or HDPE liner as soon as practicably possible upon the cessation of waste infilling. The HDPE capping may comprise either temporary or permanent low permeability capping systems as directed by the General Manager and Project Management Team. Attention will be paid to placement of capping/cover systems across finished profiles of waste and exposed internal flanks.

Where possible the operational cells should be tipped in a method that opens up sections for temporary and permanent capping as soon as practicably possible.

Permanently capped areas covered with restoration material accepted in accordance with Schedule 2 of the Permit. Any restoration material which is identified to present a risk of offsite odorous emissions will be diverted to the operational phase for deep burial.

### **5.11 Minimising Disturbance to Previously Emplaced Waste**

Measures will be taken to ensure that disturbance, exposure and movement of previously emplaced waste is avoided or minimised wherever possible.

In the event that placed waste must be disturbed, a mobile odour management system containing a neutralising agent will be utilised at this location in addition to any other sensitive areas of the installation.



Where practicable, consideration will be given to the prevailing weather conditions when undertaking such activities in order to minimise any potential off-site odour impact.

### 5.12 Planned Temporary Odorous Activities

If it is necessary to undertake planned temporary actions that are not associated with normal landfilling operations and have an associated high risk of significant off-site odour impact, the General Manager will contact the Environment Agency before such actions are taken to advise of:

- the operation being undertaken
- the reasons(s) for doing so
- planned additional odour mitigation measures
- timescales for completion

Where practicable, consideration will be given to the prevailing weather conditions when undertaking such activities in order to minimise any potential off-site odour impact.

Where 'unplanned' temporary odorous activities occur (e.g. in the event of a site emergency) they will be addressed immediately in accordance with the appropriate emergency plan or other applicable document.

### 5.13 Landfill Gas Infrastructure

As capping and restoration progresses across the site, the existing active gas abstraction network will be protected and maintained and will continue to be operated in accordance with the site Gas Management Plan in order to maintain gas control.

Disruption to the normal operation of in-waste gas abstraction infrastructure associated with restoration activities will be limited wherever practicably possible. The frequency of routine gas field balancing and inspection will be increased as required, as directed by a responsible manager.

The gas collection network will be connected to the on-site gas compound for flaring and/or energy production. Additional gas abstraction infrastructure will be installed across completed areas of the site as soon as practicably possible following completion of the cap emplacement (GMP Section 1.4.2).

### 5.14 Landfill Gas Management

Landfill gas management will be undertaken in accordance with the current Gas Management Plan.

To maintain control of in-waste gas, the gas treatment systems at work on a flare-led basis, which ensures that the level of gas extraction from the site is not impacted by the engines coming on and off line and/or any alteration in the load. The flare automatically treats any gas that the engine(s) would have otherwise used thus ensuring that the maximum sustainable flow from the site is maintained at all times. See GMP Section 1.4.4.

### 5.15 Gas Field Maintenance

The gas field is maintained in accordance with the current Gas Management Plan (Section 1.4.2), with the infrastructure being assessed for defects visually whilst balancing the field and/or manifold.

Any works required to be undertaken on the gas field at the site will be undertaken in accordance with Section 1.4.2 of the GMP. Where such works are undertaken, a daily record will be made at the end of each working day to ensure that all elements of the gas system that have been worked on have been reconnected to the gas system or have been sealed to prevent the emission of gas odour until such time that reconnection can be made. The General Manager retains the

responsibility to ensure that all potential sources of odour have been minimised.

### **5.16 In Waste Leachate Extraction Systems**

All leachate abstraction and monitoring infrastructure will be adequately sealed and will be connected to a leachate main that runs directly to the onsite Leachate Treatment Plant (LTP) to prevent any potential for fugitive odour release. Routine checks will be undertaken by the site management team to ensure that the leachate wells remain sealed and under adequate extraction from the gas collection system.

### **5.17 Leachate Storage**

Leachate at the site is stored and biologically treated in the site's LTP in the south-eastern corner of the site ensuring minimal diffusion of odorous air. It is noted that at the time of writing the LTP has not been identified as a source of problematic odour. The plant is situated near the site entrance, approximately 160 m from receptors. The treatment plant is designed and actively managed in order to maintain effective aerobic leachate treatment capabilities; where required, any excess sludge is removed from the plant for disposal in line with normal management practices.

### **5.18 Odour Management Sprays**

Odour management sprays containing masking and/or neutralising agents will be utilised around sensitive areas of the installation, as required. A combination of temporary mobile bowser and fixed fence-line spray deodorising systems may be utilised at the site.

The locations of the fixed fence-line deodoriser systems currently in use at the site are shown in Appendix 1. These locations have been chosen with due regard to potential on-site odour sources, the prevailing meteorological conditions at the site and the situation of off-site potential receptors.

The fixed fence-line deodoriser systems may be supplemented by use of mobile spray deodoriser units, as required. Such spray deodorisers are typically most effective when located at source in association with temporary high odour-risk activities such as disposal of particularly odorous waste streams or gas abstraction well installation.

### **5.19 Plant Maintenance**

Site infrastructure and plant will be inspected for damage and wear by all responsible personnel at a minimum daily/weekly frequency. Records of these checks will be maintained in the daily checks log.

All plant and equipment will be maintained in good working order and in accordance with the supplier or manufacturer's recommendations.

### **5.20 Training**

All Valencia personnel working at the facility are subject to a formal documented training programme in accordance with Company procedures. Matters relating to environmental management and control form part of this core training programme for all individuals.

Additional training will also be provided for personnel required to complete subjective odour surveys in accordance with Section 5, below. Where possible, Valencia staff and third party specialist monitoring contractors who are required to undertake subjective odour surveys will be formally assessed for odour sensitivity and detection threshold at a specialist facility (e.g. Silsoe College, or equivalent) in order to demonstrate suitability for this subjective monitoring role. This assessment will ideally be conducted prior to any monitoring event, however, if this is not possible, this will be done as soon as practicable.

### **5.21 Community Liaison**

Site contact details and emergency (out-of-hours) numbers are shown on the site entrance gate and Company website. Direct feedback to site is encouraged at all times in relation to any perceived issues associated with operational activities. Members of the public can contact site via the Shelford Incident Reporting Hotline.

### 5.22 Unit Emergency

In the event of site emergency, the General Manager will be notified without delay. The relevant UEP (Unit Emergency Plan) will be implemented by the responsible person(s), as follows:

- Accident, Injury on site
- RTA involving Waste Carrying Vehicles
- Adverse Weather
- Contaminated Groundwater
- Dust
- Landfill Gas Emissions
- Leachate Escape
- Fires In Administrative Areas
- Fuel & Oil Storage
- Diesel Tanks
- Subterranean Fires
- Surface Fires
- Vehicle & Load Fires
- Flood
- On Site Leaks & Spillages
- Non-Compliant Waste
- Odour
- Vermin

## 6. Odour Monitoring

### 6.1 Meteorological Conditions

A meteorological station is installed at the site. It is calibrated and maintained in order to measure and record weather conditions (including atmospheric pressure, and wind speed and direction) at automated 15-minute intervals. The data collected by the weather station will assist site management in undertaking necessary actions such as modifications to site operations, the use of deodorising sprays, or additional monitoring resources to be implemented.

In promoting proactive management of the risks arising from the site, site management will review the weekly forecast of meteorological conditions for the site at the start of each working week. Details of the forecasted conditions will be assessed against proposed activities for the period. Key data to assist the General Manager will be the assessment for wind speed, wind direction and potential atmospheric pressure changes.

In the event of failure of the station, meteorological data will be obtained from Valencia's local and national network of monitoring stations and from other commercial organisations such as <http://www.xcweather.co.uk> while the site's unit is re-instated/repaired. The target time for repair of the station is within 5 working days of identification of a fault relating to wind speed, wind direction or atmospheric pressure.

### 6.2 Regular Inspection/Olfactory Monitoring

A plan showing the site boundary odour monitoring locations as well as the off-site odour monitoring locations is included in Appendix 1.

### 6.3 Subjective Odour Surveys

All installation personnel are responsible for reporting any odour problems immediately to the

General Manager (or appropriate responsible person). Routine site walkover inspections are completed by site management during the permitted operational hours of the site. Any observations and associated actions are recorded and implemented.

Site management will ensure that a weekly inspection is made of the upwind and downwind installation boundary during operational periods in order to establish whether any odours are discernible. The results of this survey will be recorded.

Records will be maintained using the 'Odour Survey Log Sheet' – see Appendix 3. The monitoring frequencies may be increased to reflect site activities and/or the perceived odour sensitivity at the site, as directed by the General Manager.

The inspection will be undertaken as follows:

1. The monitoring person will visit the specified site boundary monitoring locations.
2. The monitoring person will stand still and breathe deeply facing upwind.
3. If odour is detected, but can only be detected in this manner, the odour 'intensity' should be recorded as 2 (faint). If odour is detected while walking or breathing normally, the intensity should be recorded as at least 3 (moderate).
4. The General Manager or responsible person will be notified immediately of any detected odours that are considered to have the potential to give rise to significant off-site odour impact (odour intensity >3).
5. If an odour is detected at off-site monitoring locations that is considered to be attributable to Shelford Landfill activities, a further on-site inspection will be carried out seeking to trace the odour plume back to source. The site investigation will incorporate detailed assessment of the site infrastructure and operational conditions against the specific requirements of the odour controls set out in Section 4, above, to determine any diversion away from 'normal' site operating conditions. The General Manager will be informed so that the appropriate corrective and/or preventative action can be taken.
6. Following detection of any odour at site boundary or off-site locations that is not attributable to Valencia's activities, the monitoring officer will attempt to trace back the odour plume in order to identify and record the third-party odour source.

Observations including time, date, weather conditions, odour type, location, intensity, and extent will be recorded on the Odour Survey Log Sheet (Appendix 3), which will be maintained at the site office. Site operating conditions at the time of the survey will also be recorded.

Periodic accompanied comparison odour assessments will be completed by the Compliance Manager/Environment Advisor, who is primarily office-based at a remote location. All staff responsible for assessing odour will complete documented training on the odour inspection procedure in addition to formal odour sensitivity and detection threshold assessments, as described in Section 4.20, above.

#### **6.4 Monthly Flame Ionisation Detector (FID) / Subjective Odour Survey**

In addition to the above weekly site boundary and offsite odour surveys, supplementary routine monthly FID and subjective odour inspections will be undertaken at the site boundary (see Appendix II for the locations), weather permitting. These will be completed in accordance with Valencia's Methane in Air –FID Monitoring (Site Perimeter) Procedure.

The compliance level for methane in ambient air is 10 ppm at the site boundary. In the event that the 10 ppm FID level is exceeded at a particular boundary location, the monitoring technician will attempt, so far as is reasonably practicable, to trace the source of the emission. In the event that a source is identified, the General Manager, Environment Advisor and the Compliance Manager will be notified by the monitoring technician and appropriate remedial actions will be implemented. In the event of such an exceedence, a Schedule Notification will be submitted to the Environment Agency setting out the above information.

It is noted that unfavourable meteorological conditions (as specified in Methane in Air –FID Monitoring (Site Perimeter) Procedure) may limit Valencia’s ability to complete FID (and other associated air quality) monitoring. Should it prove necessary to abort a scheduled monitoring event, Valencia will assess the weather forecast data for the remainder of the required period in addition to site performance data up to and during the required period of monitoring.

Records of FID calibration certificates will be kept and maintained by Valencia’s external monitoring contractor.

### **6.5 Monitoring of Landfill Gas and Leachate Infrastructure**

Active management of the source term of odour at the site is essential to minimising the risks of odour being detected beyond the site boundary. Demonstrating the integrity and efficiency of the gas management and leachate collection system is essential and will be monitored in accordance with the site’s GMP. As outlined in above, this will include checks on gas management parameters, integrity of pipe work, and other infrastructure. Records will be maintained of any required remedial works, timescales and responsibilities for their completion within the HolisTech computerised maintenance system.

Additional FID monitoring of key on-site landfill gas and leachate management infrastructure will be completed at minimum six monthly intervals, weather permitting. In seeking to ensure all key elements of the site’s infrastructure remain sealed, supplementary FID surveys may also be completed at the General Manager’s discretion. Monitoring will be completed in accordance with Section 13 of the Valencia Gas Operating Standards Manual.

### **6.6 Monitoring of Gas Flares and Engines**

The efficiency of the gas flares and engines will be assessed at regular intervals in order to ensure that optimum combustion conditions are maintained in accordance with the site’s GMP. In accordance with Permit Condition 3.5.1 and Table S3.10, flare/engine exhaust emissions monitoring will also be undertaken on an annual basis and assessed against the specified emission thresholds.

### **6.7 Surface Methane Emission Surveys**

In accordance with Permit Condition 3.5.1 and Table S3.8, surface methane emissions will be measured on an annual basis. Valencia will undertake additional surface emissions monitoring to support operational management as required.

### **6.8 Perimeter Gas Monitoring**

In accordance with Permit Condition 3.5.1 and Table S3.5, perimeter gas monitoring will be routinely undertaken at the site boundary network. Monitoring will be completed in accordance with Section 11 of the Gas Operating Standards Manual. Section 11 of the Gas Operating Standards Manual also sets out the explicit actions that will be undertaken in response to a breach of an ‘action level’ or ‘compliance limit’ in the site’s perimeter gas monitoring network.

### **6.9 Trace Gas Analysis**

In accordance with Permit Condition 3.5.1 and Table S3.10, trace gas analysis will be undertaken at the input to the Gas Utilisation Compound on an annual basis. The returned trace gas concentrations will be assessed against the assumptions made in the Landfill Gas Risk

Assessment and associated dispersion modelling. Results will be submitted to the Environment Agency in accordance with the timescales provided in Permit Schedule 5.

### 7. Odour Action Plan

#### 7.1 Odour Complaint Investigation

The following actions will be taken on receipt of an external odour complaint:

1. The responsible person receiving the complaint at the site will initially record the key details as follows:

- Date/Time Complaint Received
- Date/Time of Complaint Event
- Complaint Received From: EA/Resident/EHO
- Name and Address of Complainant
- Telephone Number of Complainant (if available)
- Feedback Requested (Yes/No)
- Type of Complaint (e.g. odour, noise, litter, etc)
- Location of Incident (if not at Complainant's address)
- Complainants Description of the Incident (e.g. odour/noise type, extent of issue (localised/widespread), intensity [scale of 1 (very faint) to 6 (extremely strong)], duration, constant or intermittent)

2. The General Manager, or appropriate deputy, will be informed of the odour complaint as soon as possible, including the location, time and date of the complaint being lodged (where available).

In recognising that odour can be transient and short-lived, timely notification of odour complaints directly from the complainant and/or the Environment Agency is imperative to allow for appropriate investigation. If the odour complaint occurs more than 3 hours before notification is provided to Valencia, or out of operational times, it will not be possible to fully investigate or substantiate the complaint. Valencia will, however, complete and record a comprehensive complaint investigation, as set out below, for all complaints received at the site.

3. If the complaint is received within 3 hours of the incident and within operational hours, the General Manager (or appointed representative) where available will visit the complaint location as soon as possible in order to subjectively determine odour presence or absence.

4. If an odour is present, the key 'FIDOR' criteria will be assessed at the complaint location, as follows:

<i>Frequency</i>	is the odour intermittent or persistent; is there a history of complaints at this location?
<i>Intensity</i>	is the odour faint, moderate, strong, or very strong?
<i>Duration</i>	how long is the odour present at this location?
<i>Offensiveness</i>	provide a description of the odour; is it high, moderate, or low offensiveness?
<i>Receptor Sensitivity</i>	is the odour present at a remote or highly sensitive location; is the odour plume localised or widespread?

[See also: 'Classification Systems', Appendix]

5. The General Manager or Supervisor and the Environment Advisor or the Compliance Manager will subsequently undertake the following further assessment process:

- Review of the site operations at the site prior to and at the time of the complaint;
- Review of the environmental control systems operative prior to and at the time of the complaint;
- Review of the meteorological conditions (wind speed/wind direction/rainfall/atmospheric pressure) prior to and at the time of the complaint – to establish whether a pathway can be

- established between the site and the complainant;
  - Review of the previous complaint history at the location identified.
6. Odour complaint details will be transferred to Valencia's internal BMS Incident Management System in accordance with the Valencia Non-conformance and Complaints Procedure.
7. The odour complaint will be substantiated (or otherwise) by the General Manager or Supervisor in accordance with the following (in order of priority):
- i. The Environment Agency has visited the complaint location and has provided confirmation that the odour exists, is significant, and is attributable to Shelford Landfill;
  - ii. The General Manager has visited the complaint location and has provided confirmation that the odour exists, is significant (see FIDOR assessment, above), and is attributable to Shelford Landfill.

Valencia will contact the Environment Agency to discuss the complaint if the incident is deemed to be significant, allowing sufficient time for the above investigation to be completed. If the necessary contact details are available and direct feedback has been requested, Valencia will also contact the complainant directly to discuss the issue, the findings of the subsequent investigation, and any actions arising.

### 7.2 Responsible Person(s)

Valencia's primary point of contact will be the General Manager for the site on all matters associated with site operations and environmental performance. In the event that these people are unavailable or non-contactable, the contingency management staff to be contacted will be as follows:

First call to: Site supervisor  
Thereafter: Environment Advisor, Compliance Manager, Gas Resources Manager

### 7.3 Actions

7.3.1. The General Manager will be informed.

7.3.2. Thereafter the General Manager will co-ordinate with (where appropriate):

*Externally:* Environment Agency Officer

Note: Environment Agency notification will be provided without delay where the non-conformance is considered to be either high significance in terms of potential for off-site odour impact or where a Permit obligation exists (e.g. gas plant failure) and the Environment Agency is unaware of the non-conformance. Notification may also be provided to the Environment Agency as part of ongoing routine communications where the non-conformance is not considered to be of high significance.

Note: The Environment Agency will be notified by Valencia if the likelihood and potential significance of any incident is considered to be sufficiently high or may be sustained for an extended period. If appropriate Valencia will produce an action plan setting out details of actions to be taken to ensure odour is adequately controlled.

7.3.3. If the incident relates to receipt of an external complaint, an investigation will be completed in accordance with Section 6.1, above.

7.3.4. If not previously undertaken, the General Manager or appropriate responsible person will undertake a site investigation in order to determine the likely cause(s) of the off-site odour.

The site investigation will incorporate detailed and methodical assessment of the site infrastructure and operational conditions against the specific requirements of the odour controls set out in Section 4, above, to determine any diversion away from 'normal' site operating conditions.

7.3.5. Upon identification of the likely odour source(s), the appropriate corrective and preventative measures will be identified and implemented under the direction of the General Manager. Additional support and technical expertise will be provided by internal and/or external technical specialists, as required. Where necessary, the OMP requirements will be reviewed in order to ensure they continue to represent 'all appropriate measures'.

Key items for routine consideration and assessment will be as follows:

**Disturbed Waste** - Where odorous emissions arise specifically from the exposure of previously emplaced waste, the exposed area will be covered and minimised as soon as practicably possible.

**Inadequate Cover or Capping** - If the area is awaiting the installation of the engineered capping layer, the programme for capping works will be reviewed by the site management in order to identify any requirement and potential for bringing the planned works forward.

**Inadequate Gas Control** - Remedial action will involve one or more of the following, as required:

- Installation of additional gas wells;
- Increase suction on wells and operate outside of the normal balancing philosophy;
- Use of a temporary mobile flare (if full suction is not available from the gas plant);
- A comprehensive audit on the gas system to ensure its integrity and effectiveness;
- Repairs to or replacement of any malfunctioning infrastructure, e.g. pipelines, wellheads, KOPs

**Damage to the Gas Collection System** - In the event that damage to the gas collection system is identified, Section 9.2 of the GMP will be followed.

**Generator Trip** - A generator trip will be indicated by an automated telemetry call to the on call member of the Area LFG Operations Team. GMP Procedure 5.2 will be followed.

**Gas Plant Trip** - A gas plant trip will be indicated by an automated telemetry call to the on call member of the Area LFG Operations Team. GMP Procedure 5.2 will be followed.

**Leachate Wells/Monitoring Points** - The following actions will be undertaken, as required:

- Additional seals will be applied to problematic wells and monitoring points;
- Additional suction will be applied to leachate wells and monitoring points where safe to do so (due to the increased risk of fire)

#### 7.4 Timescales

In the event that it proves impracticable to carry out adequate remedial measures within one working day, the General Manager will notify and agree with the Environment Agency the proposed actions and the timescales for their completion as a programme of works.

#### 7.5 Records

Details of odour 'non-conformances' including subsequent investigations, timescales and remedial measures taken, and notifications of the relevant internal and external bodies will be recorded in accordance with the Valencia Non-conformance and Complaints Procedure.



Analysis of the weather data recorded at the on-site meteorological station and at local weather stations will also be noted in addition to the site operations at the time of the complaint, proximity and location of the complainant, assessment of other third-party odour sources in the area, date and time, etc. The internal BMS Incident Database will be used to maintain a comprehensive record of complaints received at the site and will facilitate the analysis and trending of complaints (reviewed by the site management team at routine site meetings), and the assessment of mitigation/control measure effectiveness.

### **7.6 Additional Supportive Odour Monitoring**

The requirement for (and frequency of) additional supportive odour monitoring will be agreed between the General Manager and the Compliance Manager. This may include, but not be limited to:

- Additional on-site FID/subjective odour inspections;
- Additional site perimeter FID/subjective odour inspections;
- Additional off-site FID/subjective odour inspections;
- Speciated trace volatile organic compound (VOC) sampling and analysis.

### **7 Document and Audit Review**

This Odour Management Plan will be subject to regular review by the site team in accordance with site requirements. Updated versions of this management plan will be forwarded to the Environment Agency when they are approved internally.

## 8. APPENDIX A – Odour Classification and Meteorological Data Referencing

### 8.1 Odour

<p><b>1. Character</b></p> <p><b>Examples:</b></p> <p>acidic, acrid, agricultural, ammoniacal, cabbage, dustbin, eggy/sulphurous, fruity, landfill gas, mains gas, oily, putrid, pungent, rotten, sickly, sour, sweet, compost, fresh waste, rotting waste, IVC compost, leachate, pet food factory, stables, burning plastic.</p>	<p><b>2. Intensity</b></p> <p>0 - No detectable odour          1 - Very faint odour (need to stand still face wind and inhale to detect)          2 - Faint odour          3 - Distinct odour - detectable when walking and breathing normally          4 - Strong odour          5 - Very strong odour          6 - Extremely strong odour</p>	<p><b>3. Extent</b></p> <p>1 - Local and transient - only detected for brief periods at site boundary when the wind drops or blows          2 - Transient as 1 above, but detected away from site boundary          3 - Persistent but fairly localised          4 - Persistent and pervasive up to 50m away from site boundary          5 - Persistent and widespread - detected &gt;50m away from site</p>
<p><b>4. Sensitivity</b></p> <p>Low – footpath/road          Medium – industrial/commercial workplaces          High - housing, pub/hotel</p>	<p><b>5. Offensiveness</b></p> <p>1 - Less / potentially offensive          2 - Moderately offensive          3 - Most / highly offensive</p>	<p><b>6. Suspected Sources</b></p> <p><b>Examples:</b></p> <p>Agricultural, Gas Plant, Leachate Treatment, Active Tipping Face, Green waste compost, In-vessel Compost facility.</p>
<p><b>7. Source Valencia Controlled?</b></p> <p><b>YES or NO</b></p>		

### 8.2 Meteorological Data

#### Beaufort Wind Scale

Force	Description	Specification	mph
0	Calm	Smoke rises vertically	0
1	Light air	Smoke drifts in wind direction; wind vanes not moved	1-3
2	Light Breeze	Wind felt on face, leaves rustle; windvanes moved	4-7
3	Gentle breeze	Leaves and small twigs in constant motion	8-12
4	Moderate breeze	Raises dust and paper; smallbranches are moved	13-18
5	Fresh breeze	Small leafy trees swayed; mediumbranches moved	19-24
6	Strong breeze	Large branches moved; umbrellasused with difficulty	25-31
7	Near gale	Whole trees moving; walking againstwind inconvenient	32-38
8	Gale	Twigs break off trees; walkinggenerally impeded	39-46
9	Strong Gale	Slight structural damage occurs	47-54

#### Pasquill Atmospheric Stability Classes

Class	Definition
A	Very Unstable
B	Unstable
C	Slightly Unstable
D	Neutral
E	Slightly Stable
F	Stable
G	Very Stable

#### Meteorological conditions that define the Pasquill stability classes

Surface Wind Speed		Sunshine		Night-time Cloud Cover	
mph	Strong	Moderate	Slight	>50%	<3/8 cover
<4.5	A	A - B	B	-	G
4.5 – 6.7	A - B	B	C	E	F
6.7 – 11.2	B	B – C	C	D	E
11.2 – 13.4	C	C – D	D	D	D
>13.4	C	D	D	D	D

**Note: Class D applies to heavily overcast skies, at any windspeed day or night**