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**Fortum Carlisle Limited**

Odour Management Plan

## Document approval

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## Management Summary

Fortum Carlisle Limited (Fortum) is applying to the Environment Agency (EA) under the Environmental Permitting (England and Wales) Regulations 2016 (Environmental Permitting Regulations) for an Environmental Permit (EP) to operate an Energy Recovery Facility (ERF) to be known as Kingmoor ERF (the Facility). The Facility will incinerate waste fuel and will be located on land adjacent to the Kingmoor Park Industrial Estate, Carlisle.

Although not mandatory under the EA Guidance Note, titled *'Control and monitor emissions for your environmental permit'*, the EA has requested for an Odour Management Plan (OMP) to be produced for the Facility. The aim of this report is to detail the provisions which will be taken into account during the design phase of the Facility to manage operational risks that may lead to odour nuisance.

The Facility has been designed in accordance with the recommended best practice and UK odour management guidance, including the following:

- EA Sector Guidance Note S5.06: *'Guidance for the Recovery and Disposal of Hazardous and Non-Hazardous Waste'*;
- EA Guidance Note H4: *'Odour Management - How to comply with your environmental permit'*;
- *'An industry guide for the prevention and control of odours at biowaste processing facilities'*, The Composting Association, 2007; and
- *'Odour Guidance for Local Authorities'*, DEFRA, March 2010.

The primary point source for potential releases of odour from the Facility is the main stack.

Potential sources of fugitive emissions of odour are listed as follows:

- deliveries of incoming waste; and
- the waste bunker.

The principal control measures for the mitigation of odour from the Facility as a result of waste storage are listed as follows:

- Waste storage area will be enclosed and maintained at a negative pressure.
- Potentially odorous air from waste storage area will be extracted and used as combustion air within the thermal treatment process. Potentially odorous chemicals will therefore be combusted at high temperatures which is likely to destroy the majority of odorous substances.

There are a small number of sensitive receptor locations within 1 km of the stack, refer to Appendix B. The closest residential receptor is an unnamed farm located approximately 770m south/southeast of the Facility. The Facility is predominantly surrounded by industrial and some commercial premises which are considered to have a low sensitivity to odour.

Arrangements and responsibilities for monitoring of odour at the Installation Boundary have been identified.

During the construction and commissioning phase of the Facility, documented management systems will be developed. This will include odour control procedures to investigate reported odour complaints and set out actions to resolve any issues identified, whilst implementing actions to prevent the re-occurrence of complaints.

A system for the periodic review of this Odour Management Plan has been proposed following completion of detailed design. Any changes to the requirements of the Odour Management Plan will need to be formally agreed with the Environment Agency prior to their implementation.

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# 1 Introduction

Fortum Carlisle Limited (herein referred to as Fortum) is developing the Kingmoor ERF (the Facility). The Facility will incinerate waste on land adjacent to the Kingmoor Park Industrial Estate, Carlisle.

## 1.1 Background

The purpose of this document is to detail the provisions which have been taken into account during the design phase of the Facility to manage operational risk leading to an odour nuisance. However, it should be noted that this report will be subject to review following completion of detailed design of the Facility.

It is proposed that a Pre-Operational Improvement Condition is included within the EP requiring a revised OMP (if appropriate) to be submitted to and approved by the Environment Agency (EA) prior to commencement of operations.

The Facility will be designed in accordance with recommended best practice and UK odour management guidance, including the following:

- EA Sector Guidance Note EPR 5.01: *'Incineration of Waste'*;
- EA Sector Guidance Note S5.06: *'Guidance for the Recovery and Disposal of Hazardous and Non-Hazardous Waste'*;
- EA Guidance Note H4: *'Odour Management - How to comply with your environmental permit'*;
- *'An industry guide for the prevention and control of odours at biowaste processing facilities'*, The Composting Association, 2007; and
- *'Odour Guidance for Local Authorities'*, DEFRA, March 2010.

## 1.2 Objective

In accordance with the H4 guidance, the report has been developed using the following structure:

- Section 2 provides a detailed description of the site and the operations to be undertaken.
- Section 3 presents a review of potential odour sources, pathways and receptors.
- Section 4 details the proposed odour management and control measures.
- Section 5 details the requirements for odour monitoring.
- Section 6 considers abnormal events and appropriate response measures.
- Section 7 details procedures for complaints and contingency.
- Section 8 sets out the proposed timescales for review and update of this OMP.

## 2 Site Location and Description

### 2.1 The Site

The Facility will be located on land adjacent to the Kingmoor Park Industrial Estate, Carlisle, which is accessible from the A689 via Kingmoor Park Road. The stack is located at an approximate National Grid Reference of NY 38146 59187, approximately 4-5 km north-west of Carlisle city centre.

To the north of the Installation Boundary is Kingmoor Park Road. The A689 is to the east of the Installation Boundary and a railway line (the West Coast Mainline) lies approximately 100m from the western boundary. A number of industrial facilities are located to the north, east and south of the Installation Boundary. Carlisle town centre lies approximately 5km south/southeast of the Facility.

A site location plan and Installation Boundary drawing are presented in Appendix A of the Supporting Information.

### 2.2 Summary of Site Operations

The Facility will comprise waste reception; waste storage; water, fuel oil and air supply systems; furnace; boiler; steam turbine/generator set; facilities for the treatment of exhaust or flue gases; on-site facilities for storage of residues and waste water; flue with associated stack; and devices and systems for controlling combustion operations and recording and monitoring conditions.

Assuming a design NCV of 10 MJ/kg, the Facility will process approximately 250,000 tonnes per annum (at the design capacity of 31.3 tph, assuming 8,000 hours availability).

Allowing for the full range of NCV wastes that the Facility can process (8-15 MJ/kg), and assuming continuous operation throughout the year (i.e. 8,760 hours of operation), the Facility will have a maximum capacity of up to approximately 274,000 tonnes per annum.



## 3 Review of Potential Sources, Pathways and Receptors

### 3.1 Odour Sources

An odour is the organoleptic attribute perceptible by the olfactory organ on sniffing certain volatile substances – odorous substances have a property which makes them perceptible to our sense of smell. The chemical compound (i.e. the ‘odorant’) is volatilised in air and acts as a stimulus which the receptor interprets as an odour.

Odorants may be a single chemical but more typically are a complex mixture of compounds and can also be associated with fine particulates. This complex mix often makes reliable “chemical” analysis or measurement at source difficult. Typically, odours are detected at very low concentrations of chemicals and compounds in air. The human nose is very sensitive with on average over 5 million scent receptors. Humans can detect concentrations as low as a few parts per billion (ppb).

Odours may be perceived as pleasant or unpleasant. The main concern with odour is its ability to cause a response in individuals that is considered to be objectionable or offensive. Whilst there is often agreement about what constitutes pleasant and unpleasant odours, there is a wide variation between individuals as to what is deemed unacceptable and what affects our quality of life.

The primary point source for potential releases of odour from the Facility is the main stack. Potential sources of fugitive emissions of odour are listed as follows:

- deliveries of incoming waste for processing; and
- the waste bunker.

### 3.2 Pathways

Odours released to air from identified sources have the potential to be conveyed to nearby receptors via transfer through the air.

The extent to which odour is detectable downwind is dependent upon the following factors, all of which can exhibit substantial variation over time:

- the nature and magnitude of the odour emission released from the Facility;
- the wind direction and wind speed; and
- atmospheric turbulence (vertical and horizontal) and the level of dilution and dispersion odours undergo as they travel downwind.

### 3.3 Receptors

The identification of potentially sensitive receptors has been conducted on the basis that the level of exposure to odour likely to generate annoyance in residential receptors tends to be considerably lower than the levels which may generate annoyance at commercial or industrial receptors, where higher tolerance to odour exposure can generally be expected. The exception to this is a public house, restaurant or café which have outside seating areas, and therefore are likely to have a greater sensitivity to odour than other commercial premises.

A number of sensitive receptors, including a mixture of industrial, commercial and residential receptor locations, have been identified within 1 km of the Facility as part of the Odour Sensitive Receptor Assessment – presented in Appendix B.



## 4 Odour Management and Control Measures

The Facility is subject to detailed design. Where design information is available, it has been considered within this OMP. Following completion of detailed design, additional information in relation to the control measures to be implemented on-site will be incorporated into the OMP.

Prior to commencement of commissioning of the Facility, a commissioning plan will be submitted to the EA for approval. This will include measures to be taken to prove performance of the odour abatement measures detailed in this section. The commissioning plan will include, but not be limited to the following:

- Confirmation of the management and contractual arrangements of the waste materials imported into the Facility.
- Further details associated with the storage capacity of the waste bunker, with storage times of incoming waste supplied on completion of detailed design of the Facility. The detailed design information will also be used to support the development of the final OMP.
- The development of waste acceptance criteria that limit the types of waste received at the Facility. This will be supplemented by random monitoring of suppliers and the waste to be transferred to the Facility.
- The waste acceptance procedures will specify that no malodorous materials are accepted at the site, and will provide definitions/criteria to determine what constitutes a 'malodorous' material.
- Design and management of the mechanical ventilation systems to prevent the release of fugitive emissions from the Facility.
- Extent of building enclosure and management of the operation of access doors.
- Management of emergency situations.

### 4.1 Monitoring

Routine olfactory inspections of the site (assumed to be once a week) will be conducted during operational hours by trained operators. During periods of shutdown, these inspections will be conducted on a daily basis. Staff will conduct the olfactory surveys upon arrival to site (i.e. before being exposed to odour for a long period of time). During inspections, a walk-around of the installation boundary, as identified in Appendix A, will be conducted and observations made concerning the type and nature of any odours detected, including information on the likely source. The monitoring will be recorded and incorporated into the documented site management systems.

In the unlikely event that odour is detected at the installation boundary, the source will be investigated. Once the source and cause of the odour has been identified, appropriate mitigation measures will be implemented to prevent fugitive emissions.

### 4.2 Control Measures

All waste handling, transfer and treatment activities at the Facility will be undertaken within enclosed buildings, with negative pressure maintained within the waste bunker area through the mechanical ventilation system, which will minimise the potential for the release of fugitive odour emissions from the Facility.

Where appropriate, documented pre-a and acceptance procedures for incoming waste will be developed to ensure that 'unacceptable' wastes (that may potentially be odorous) are not delivered to the Facility. The waste acceptance procedures will specify that no malodorous materials are

accepted at the site, and will provide definitions/criteria to determine what constitutes a 'malodorous' material. Should unacceptable waste be delivered to the Facility, suitable systems will be in place to ensure that the delivery is either rejected and sent back to the supplier, or stored within a suitable quarantine area at the Facility (assumed to be in the main waste reception building) before being transported off-site to a suitably licenced waste management facility.

In the unlikely event that these control measures do not minimise the release of fugitive odour emissions, the action plan discussed in section 7.2 will be implemented.

#### 4.2.1 Receipt and Management of Wastes

All waste deliveries will be transported in enclosed vehicles. Waste will not be unloaded until the delivery vehicles are located within the enclosed waste reception area. This will prevent the release of fugitive odour emissions during transport of the waste to the Facility.

The waste fuel will either be pre-processed or source segregated prior to delivery to the Facility, with waste only accepted if it is in accordance with the Facility's documented waste acceptance procedures. The waste acceptance procedures will specify that no malodorous materials are accepted at the site, and will provide definitions/criteria to determine what constitutes a 'malodorous' material.

The waste reception area will have sufficient space for the inspection of waste deliveries, if needed, and for the potential quarantine of any 'non-compliant' waste.

The tipping hall will have a number of tipping bays to allow the simultaneous tipping of waste and also control over the deposition location of waste into the bunker. When delivering waste to the Facility, waste delivery vehicles will reverse into an assigned tipping bay and unload their waste into the waste bunker.

The waste bunker area will be maintained at negative pressure through the extraction of air through a mechanical ventilation system from this area for subsequent use in the combustion process.

The delivery and unloading of waste will be supervised by site operatives. If the waste is identified as being 'unacceptable', it will be either returned to the supplier or quarantined within a dedicated quarantine area prior to transfer off-site. Investigations will be undertaken with the waste supplier to identify the reason for malodorous materials being imported into the site, and appropriate actions taken to prevent reoccurrence.

Anaerobic conditions can lead to the generation of odorous air within the waste reception bunker. Incoming waste delivered to the Facility will be stored in the waste reception bunker for the minimum period of time to prevent the formation of anaerobic conditions within waste bunker area. The continuous operation of the Facility will minimise the storage times for waste within the waste bunker. Waste reception areas will be cleared and cleaned during regular maintenance operations.

Where appropriate, prior to periods of planned maintenance, waste stored within the waste bunker will be 'run-down' so that it does not contain significant quantities of old and potentially odorous material during planned shutdown periods. In the event of an unscheduled shutdown, an air extraction and abatement system utilising carbon filters may be used if deemed necessary to maintain negative pressure and reduce odour within the waste bunker area, refer to section 4.2.1.1.

Should a period of extended unplanned shutdown occur, arrangements will be made to stop or divert incoming waste to the Facility. It should be noted that there will be no external storage of potentially odorous waste associated with the operation of the Facility.

#### 4.2.1.1 Additional Measures During Shutdown

The Facility will include an effective odour abatement system to be utilised (if necessary) for the treatment of potentially odorous air from the waste bunker area during extended periods of shutdown. The design of the odour abatement system will include the following:

- Odour abatement system utilising carbon filters;
- Fan and ductwork; and
- Discharge via an odour control stack located on the top of the waste reception building.

It is intended for the odour abatement system to be controlled from the Control Room, and operate during periods of both planned and unplanned shutdown of the Facility if required.

During normal operation of the plant, when the abatement system is not operational, the carbon filters will be isolated to prevent the carbon from being unnecessarily exposed to ambient air within the waste bunker area. This will retain the quality of the carbon. Doors to the tipping hall will be kept closed unless waste deliveries are occurring.

During periods of shutdown, all doors to the waste bunker area will remain closed. This will help to contain any odour within the waste bunker area and ensure that the abatement system is effective in preventing the release of odour. The combination of both enclosing the waste bunker area and the design of the odour abatement system will ensure that the potential for the release of odours outside the building is minimised.

The operational temperature of the carbon filter system will be approximately the same as the ambient temperature in the waste bunker area. This will typically be below 30°C. Ventilation in the waste bunker area, provided either by the boiler ID Fan or by the carbon filter system when the ID fan is not operating, will maintain ambient temperatures by drawing air in through louvres in the waste bunker area from the reception hall. It should be noted that even during periods of shutdown, i.e. when no combustion is taking place, the boiler ID Fan may still be operational at times providing ventilation to the waste bunker area and maintaining the ambient temperature.

Should odour be detected during periods of shutdown when the odour abatement system is effective, the carbon filter system will be inspected to confirm its integrity, and, if required, the filter media will be replaced. During normal operation of the Facility, regular inspections will be undertaken to monitor for odour (refer to Section 5). These inspections will include for odour monitoring in both the waste bunker area and the external boundary of the site, monitoring the position of louvres and monitoring combustion air flow with odorous air extracted via the boiler and stack (if operation of the ID fan can be maintained). During periods of shutdown, the frequency of these inspections will increase. In addition, during shutdown, a daily 'sniff test' and inspection around the boundary of the Facility will be conducted.

The odour abatement system will include inlet dust filters (or 'pre-filters') to protect the carbon from any dust within the air in the waste bunker area. Pre-filters will need replacing as soon as they become soiled. Replacement of the pre-filters will be undertaken manually, and typically will involve entering the housing, removing and bagging the soiled filters, cleaning down the housing and replacing with new filters. The replacement of the carbon filter material will be conducted in accordance with the manufacturer's recommendations.

The frequency of the replacement of carbon filter material will be dependent on the extent of odours generated, and the frequency and hours of operation of the odour abatement system. Taking this into consideration, the operational hours of the odour abatement system will be recorded as part of the monitoring of the system.

Further detail on the monitoring and maintenance of the odour abatement system is subject to detailed design of the Facility. However, it is understood that the system will be subject to a

preventative maintenance regime; taking into account the limited hours of operation of the system and minimum maintenance expected to be required.

#### 4.2.2 Incoming Waste

Incoming waste will be transferred to the waste bunker. The capacity of the bunker will be approximately 6,700 m<sup>3</sup>, equivalent to approximately 2,350 tonnes of waste and 3 days of waste processing capacity (the bunker size is subject to detail design).

#### 4.2.3 Incinerator Bottom Ash

Due to the high temperatures, organic substances within the waste will have been destroyed within the waste incineration process. Therefore, incinerator bottom ash (IBA) will not be odorous and will be managed has not been considered any further within this assessment.

IBA will be handled and stored in an enclosed IBA storage area. The IBA storage area will have the capacity for the storage of approximately 650 tonnes of IBA (subject to detailed design), equivalent to approximately 4 days of IBA production assuming continuous operation.

#### 4.2.4 Air Pollution Control Residues

Due to the high temperatures within the waste incineration process, any organic substances within the waste and flue gases will have been destroyed. Therefore, it is unlikely that the APCr will be odorous, and has not been considered any further within this assessment.

APCr will be stored within sealed/enclosed silo. The design of the silo is subject to detailed design, but it is expected that the capacity of the silo will be equivalent to 6 days storage assuming continuous operation at full load.

### 4.3 Point Source Odour Emissions

During normal operation, any point source odorous emissions from the Facility will likely be from the main stack which emits combustion gases.

Emissions from the Facility will be released from a flue located within the main stack. Air from the waste bunker area within the main process building will be extracted by a mechanical ventilation system to be used as combustion air within the furnace. The Industrial Emissions Directive (IED) requires that any combustion gases passing through a waste incineration plant must experience a temperature of 850°C or more for at least two seconds. Due to the high temperatures experienced by the gases, most odorous chemicals will be destroyed. Any surviving odorous chemicals may become trapped in the bag filters of the flue gas treatment system.

An SNCR reagent (ammonia solution) to abate NO<sub>x</sub> will be introduced into the furnace as part of the FGT process prior to acid gas abatement. As part of this system, there may be occasional “ammonia slip” during operation. The impact of emissions of ammonia from the Facility have been assessed in an Air Quality Assessment submitted with the EP application (refer to Appendix E of the Supporting Information). This has demonstrated that the emissions of ammonia from the Facility will not have a significant impact upon the environment.

The release of the flue gases from the stack will assist with dispersion of the flue gases. Taking this into consideration, it is considered highly unlikely that there will be any malodorous air from the Facility detectable at sensitive receptors.

To prevent fugitive odour emissions from a bag filter failure, there will be online monitoring of the pressure drop within bag filter compartments to identify when there has been bag filter failure. If a pressure drop is identified, the relevant bag filter compartments will be isolated to prevent uncontrolled emissions and repaired before being brought back on-line.

During periods of shutdown, potentially odorous air will be extracted from waste bunker area and released via an odour abatement system with a dedicated odour abatement stack.

## 4.4 Fugitive Emissions

Identified possible sources of fugitive emissions of odour are:

- deliveries of waste for processing at the Facility; and
- waste storage areas.

### 4.4.1 Deliveries of Waste for Processing

All waste will be delivered to the Facility in enclosed vehicles/containers, which will contain any fugitive emissions during transport to the waste reception areas. Wastes will not be unloaded until the delivery vehicles are within the enclosed waste reception area.

### 4.4.2 Waste Storage Areas

An induced draught (ID) fan will be used to maintain the waste bunker at negative pressure, with extracted air to be used as combustion air in the thermal treatment process. This will ensure that odour is unable to escape from the waste storage areas.

If deemed appropriate, the crane operators will employ bunker management procedures which will include for mixing of the waste, using the crane grab, to avoid the development of anaerobic conditions in the bunker, which could generate further odorous emissions.

In the event of an unplanned shutdown, a mechanical extraction and abatement system which utilises carbon filters will be used to maintain the negative pressure environment and minimise the risk of odours being released from the waste bunker area. Abated emissions from the odour abatement system will be released from a dedicated odour abatement stack.

In addition, during a period of shutdown, the doors to the waste bunker areas will remain closed to contain potential fugitive odour emissions, with incoming waste stopped or diverted to an alternative treatment facility.

## 5 Odour Monitoring

A programme of odour monitoring will be undertaken at the Facility. This will include for the following:

- visual inspections of the site;
- sniff testing at the installation boundary; and
- determination of wind direction and wind speed.

### 5.1 Olfactory Testing

Olfactory (sniff) testing will be undertaken at strategic locations around the installation boundary on a regular basis. Where odours at the perimeter are identified, this will be reported to Facility's management team. An investigation to determine the source and cause of the odour will be undertaken in accordance with the systems as set out in Section 7.

#### 5.1.1 Monitoring Locations

The proposed locations for odour monitoring are presented in Appendix C. The locations may be reviewed following detailed design to ensure that there are no accessibility constraints.

#### 5.1.2 Monitoring Frequency

In order to generate a detailed odour record for the Facility, regular monitoring at the installation boundary will be undertaken. This will ensure a detailed data set of data will be maintained throughout the year.

Monitoring will also be undertaken upon receipt of an odour complaint to identify and record the odours present at the time of the complaint – refer to Section 7.

Monitoring will not be conducted at a set time of day, in order to maintain flexibility in the monitoring strategy. Instead, the monitoring will be conducted when it is identified that there is a high risk of odour generation, such as during times where there are waste deliveries to the site or residues transferred from the site.

#### 5.1.3 Data collection and recording

Before commencing any odour monitoring, the individual will record pertinent details such as date, time, weather conditions and the nature of the activities being undertaken. This is summarised within a proposed monitoring template, contained within Appendix D.

In order to quantify odour at a specific level, the 'intensity' and the 'offensiveness' are recorded. These are based on a scale of 1 to 5 for 'intensity' and 1 to 4 for 'offensiveness'. The levels for the two scales are shown in Table 1 and Table 2 below.

Table 1: Odour Intensity

Scale	Intensity Rating
1	No detectable odour
2	Faint Odour (barely detectable, need to stand still and inhale facing into the wind)
3	Moderate Odour (odour easily detectable while walking and breathing normally)

Scale	Intensity Rating
4	Strong Odour
5	Very Strong Odour (probably causing nausea)

Table 2: Odour Offensiveness

Scale	Offensiveness Rating
1	No detectable odour
2	Potentially Offensive
3	Moderately Offensive
4	Very Offensive

As well as recording the odour intensity and offensiveness, general comments on the nature of the odour will also be recorded, such as persistence, transience and potential source etc.

#### 5.1.4 Action Limits

If a score of 1 is recorded for intensity and offensiveness at a monitoring location, it is concluded that odour from the Facility cannot be detected and no action is required.

If a score of 2 or higher for intensity or 2 or higher for offensiveness is recorded, then a more detailed investigation will be undertaken into the activities being undertaken and the root cause of the odour, refer to section 7.1. This approach aims to identify the source of the odour and suggest possible ways to improve operations at the Facility to prevent odour being generated.

#### 5.1.5 Wind Direction and Wind Speed

An anemometer will be used to record the wind direction and speed to provide data to inform investigations into any odour complaints which are received.



## 6 Abnormal Events

Table 3 below shows possible abnormal events which may cause odour emissions, and planned responses in the event of these occurrences.

Table 3: Abnormal Events and Response Measures

Event	Location	Likely Effect	Response Measures	Approximate Timescales for Response
Failure of an ID fan	ERF building	Increased odours within the tipping hall /waste bunker areas.	Maintenance engineers sent to rectify the failure. An air extraction and odour abatement system utilising carbon filters will be used to maintain negative pressure, minimising the risk of odours being released from the waste bunker area.	Immediate
			Facility operations suspended until the problem is rectified. Incoming waste stopped or diverted to an alternative waste treatment facility.	One day
Development of anaerobic conditions in waste storage areas	Waste tipping area and bunker	Increase in odour within the waste reception areas/tipping hall/bunker	Wastes will be mixed in the bunker if deemed appropriate to avoid the development of anaerobic conditions.	Ongoing
Bag filter failure	FGT plant	Pressure drop in the bag filters	The relevant bag filter compartments will be isolated to prevent uncontrolled emissions and repaired before being brought back on-line.	Immediate
Plant breakdown	Any location	Risk of increased impact from any area of site where normal operations are affected during and after the breakdown	A supply of critical spares will be maintained on site. The site will employ maintenance engineers to enact any repairs.	Immediate
			If spares or engineers are not available, the relevant operations and their predecessors in the process will be suspended, if necessary, to prevent significant increase in odour emissions	Immediate

In all instances where waste processing is required to be suspended, the receipt of waste at the Facility will be prohibited and incoming waste will be stopped or diverted to an alternative suitably licenced waste treatment facility.

## 6.1 Emergency Planning

### 6.1.1 Abnormal Meteorological Conditions

Abnormal meteorological conditions such as low wind speed and high temperatures may promote elevated levels of odour either on the site or at nearby sensitive receptors. Wind directions towards sensitive receptors may increase odour levels at the receptor. Conversely, very low wind strengths and temperature inversions may minimise dispersion and potentially create a build-up of odour. Elevated climatic temperatures during summer months may also increase odour.

### 6.1.2 Staffing Issues

Human error and accidents may cause elevated levels of odour to be created either through the stopping or breakdown of the process, or failure of the control equipment. Contingency mitigation measures will be developed as part of the detailed design, construction and commissioning of the Facility. This will include procedures to be implemented in case of staffing issues.

### 6.1.3 Planned Odorous Events

If at any time it will be necessary to undertake temporary activities that are likely to cause elevated levels of odour, Fortum would propose to contact the EA and any other relevant stakeholders in advance to inform them of the operations being undertaken and that any potentially elevated levels of odour will be of a temporary nature. Where practicable, such activities will only proceed when the prevailing wind direction can be demonstrated to be away from sensitive receptors.

## 7 Odour Action Plans/Contingencies

### 7.1 Odour Complaint Investigation

The following actions will be taken on receipt of an external odour complaint or the identification of odour at the installation boundary:

- Any complaints received will be logged in the Facility's documented management systems. The EA will be informed as soon as is reasonably practicable after a complaint has been received.
- The site management will be given the details of the odour complaint as soon as possible, including the location, nature, time, and date of the complaint.
- If complaints are received, odour monitoring will be undertaken in the area from which the complaint has been received in order to assess the presence of any odours in this area. Where possible, the likely cause of the odour will be identified.
- For all complaints, reference will be made to the site activities at the time of the complaints, and further onsite investigations will be conducted to determine whether any abnormal operations are (or were) occurring. The following key potential causes of abnormal emissions will be investigated:
  - Is the waste arriving in appropriate vehicles/containers?
  - Are there any unusual characteristics evident in the waste on site (composition, age, condition etc.)?
  - Are operations in 'normal operation'?
  - Are the extraction and ventilation systems (through the stack; the combustion air fans; building ventilation; and odour abatement systems) functioning properly?
  - Are there any 'unusual' activities being undertaken at the Facility?
- If investigations identify that the source of the odour is from an off-site source, feedback will be reported to the complainant, and an odour complaint will be logged with the off-site source of the odour emissions.
- If the cause of the odour is established to be on-site, appropriate actions will be immediately implemented (refer to Section 6), and actions devised to prevent reoccurrence.
- Feedback will be given to all complainants on the findings of any investigations if they are known, and a summary will be provided of any remedial measures taken to rectify the odour issues and ensure that the problem has been suitably resolved. The complainant will be asked if the perceived problem is still occurring to measure any improvement achieved.
- Fortum would propose to submit a short factual report to the Environment Agency detailing:
  - the complaint(s) received;
  - the investigations conducted;
  - the findings of those investigations;
  - whether the complaint was substantiated;
  - any remedial measures implemented; and
  - any ongoing improvement actions to be implemented.
- Records of all complaints, subsequent investigations, and remedial actions will be retained on site for a minimum of five years. The site management will ensure that records are readily retrievable and maintained as fit for retention. As applicable, records will be stored in accordance with data protection legislation.

## 7.2 Action Plans

In the event that an odour complaint is proven to be justified and attributable to operations undertaken at the Facility, or a 'non-conformance' occurs, a defined Action Plan will be implemented. The following potential odour 'non-conformances' have been identified:

- abnormal odour emissions occur;
- significant odour is detected onsite that is believed to pose a risk of impacts off-site; and
- significant site odour is detected during off-site monitoring.

In the event that any of the above occurs, the following actions will be taken:

- If not previously undertaken, a walk-around of the entire site and a review of the activities undertaken at the Facility will be conducted in order to identify the likely cause(s) of the odour.
- Upon identification of the likely odour source(s), appropriate corrective and preventative measures will be identified and implemented, depending on the outcome of the investigations. The measures will consider, but not be limited to the following:
  - Suspension of the receipt of highly odorous waste in waste reception areas and the closure of all doors until the wastes are processed.
  - Review of the effectiveness of waste acceptance, reception and handling procedures to avoid the formation of anaerobic conditions in waste storage areas.

Details of any odour 'non-conformances' including the nature of the incident, results of investigations, action taken and any required amendments to the OMP will be made available to the Environment Agency on request.

## 8 Document Review

### 8.1 Review Requirement and Timescale

This OMP will be formally reviewed by Fortum initially six months after the commencement of operations, and subsequently every twelve months to ensure that the controls described are effective and reflect best available techniques. In addition, the OMP will be reviewed following any relevant changes in site operations or procedures that are likely to have implications from an odour generation/impact perspective.

Any required changes to the conditions set out within this document will be formally agreed with the Environment Agency prior to their implementation.

# Appendices

## A Installation Boundary



## B Odour Sensitive Receptors Assessment

Ref	Receptor	Type	Approximate Distance/ Direction from Installation Boundary	Comments
O1	Lowry Hill Road	Residential	800 m SE	Considered a highly sensitive receptor, however a considerable distance away from the site and hence impacts are reduced.
O2	Cargo Road	Residential	900 m NW	Considered a highly sensitive receptor, however a considerable distance away from the site and hence impacts are reduced.
O3	Maxwell Drive	Residential	900m N	Considered a highly sensitive receptor, however a considerable distance away from the site and hence impacts are reduced.
O4	Unnamed farm	Residential	770 m S/SE	Considered a highly sensitive receptor, however a considerable distance away from the site and hence impacts are reduced.
O5	Kingmoor Park Central	Industrial	25 m N/NE	High tolerance to odour/less annoyance due to industrial nature of premises.
O6	Kingmoor Park East	Industrial	150 m E	High tolerance to odour/less annoyance due to industrial nature of premises.
O7	Kingstown Industrial Estate	Industrial	350 m E	High tolerance to odour/less annoyance due to industrial nature of premises.
O8	Kingmoor Park South Industrial Estate	Industrial	100 m S/SE	High tolerance to odour/less annoyance due to industrial nature of premises.
O9	Kingmoor Park Industrial Estate	Industrial	675 m NE	High tolerance to odour/less annoyance due to industrial nature of premises.
O10	BSW Timber Limited	Industrial	450 m NW	High tolerance to odour/less annoyance due to industrial nature of premises.
O11	Asda Superstore	Commercial	750 m NE	Considered a moderately sensitive receptor. However, located a

Ref	Receptor	Type	Approximate Distance/ Direction from Installation Boundary	Comments
				considerable distance away from the site and hence impacts are reduced.

## C Odour Monitoring Locations

## D Odour Assessment Report Template

Installation		Date	
Weather		Wind (strength / direction)	
Temperature (°C)		Pressure (mbar if known)	
Ground Conditions		Cloud Cover	
General Air Quality		Time: Start	
		Time: Finish	
Activity on Site			

Plan attached showing location & extent of odour

YES / NO

Complaint Received?

YES / NO

If YES complete the following:

Date & time complaint received		Number of complaints which may relate to the same source	
Location of complaint			
Grid Reference (if not a property)		Time odour noticed and duration	

Additional Comments:

Action Required:

Signed: .....

Date: .....

Test Location & Time	Intensity (1 – 5)	Offensiveness (1 – 4)	“Dilution to Threshold” Ratio	Comments (including persistence, transience, potential source)

**Note:** The “Dilution to Threshold” Ratio is obtained from the Nasal Ranger and is only required if an odour is detectable, i.e. a 2 or higher for Intensity.

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