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Greengate Energy Recovery Limited

Odour Management Plan

Document approval

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1 Introduction

Greengate Energy Recovery Limited (GERL) (the Applicant), is developing the Greengate Energy Recovery Facility (the Facility) to incinerate Municipal Solid Waste (MSW) and Commercial and Industrial (C&I) non-hazardous waste on land to be leased at the existing Pilkington Greengate Works, St Helens.

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 the risk of the operation of the Facility leading to an odour nuisance to the public.

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 (DOMP) to be produced for the Facility.

This report identifies the odour management controls included in the design for the Facility. 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 which requires a revised OMP to be submitted to and approved by the Environment Agency (EA) prior to commencement of operation.

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

- Sector Guidance Note EPR 5.01 – Incineration of Waste;
- Sector Guidance Note IPPC S5.06: Guidance for the Recovery and Disposal of Hazardous and Non-Hazardous Waste, Environment Agency;
- Guidance Note H4: Odour Management, Environment Agency;
- An industry guide for the prevention and control of odours at biowaste processing facilities, The Composting Association; and
- Odour Guidance for Local Authorities, DEFRA, March 2010.

1.2 Objective

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

- Section 2, is 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 the complaints and contingency procedures.
- Section 8, the proposed timescales for review and update of this OMP have been set out.

The primary objective of this document is to ensure that all appropriate measures are taken to prevent or, where that is not reasonably practicable, reduce the release of offensive odours from the Facility.

2 Site Location and Description

2.1 The Facility

GERL are proposing to develop, construct and operate a Facility fuelled by non-hazardous waste materials at the existing Pilkington Greengate Works in St Helens.

GERL have actively been developing a portfolio of renewable assets, including focus on wind, solar, biomass and energy-from-waste plants, with the aim of delivering new infrastructure in the UK renewable sector.

2.2 The Site

The site is located within the existing Pilkington Greengate Works and will be accessible via Sutton Heath Road, lying approximately 1km to the south of St Helens town centre.

The site is located in an industrial area and bounded by the existing Pilkington Greengate Works (glassworks) buildings to the north-west, greenfield land (Ravenhead Nature Park) to the south-west and south-east, and the Ravenhead retail park to the north-east.

The Pilkington Greengate works are a glass manufacturing works (or 'glassworks'), with the proposed site currently occupied by a small car park.

The surrounding area is predominantly industrial to the west, north and east, with fields and trees lying immediately south of the site on both sides of Sutton Heath Road. Further south of this lies a residential area, including Thatto Heath Community Primary School to the southwest.

Once operational, the Facility will be accessible via Sutton Heath Road and the A570/Sherdley Road Junction.

2.3 Summary of Site Operations

The Facility includes the waste reception; waste storage; water, fuel oil and air supply systems; furnace; boiler; steam turbine/generator set; facilities for the treatment of exhaust gases; on-site facilities for treatment or storage of residues and waste water; stack; and devices and systems for controlling combustion operations and recording and monitoring conditions. Waste will be delivered and stored in the enclosed fuel reception area.

The nominal operating capacity of the Facility will be approximately 37.5 tonnes per hour of non-hazardous wastes, with a net calorific value of 10.5 MJ/kg. The Facility will have an estimated availability of around 8,000 hours. Therefore, the Facility will have a nominal design capacity of approximately 300,000 tonnes per annum. However, to allow for variations in the net calorific value of the fuels being combusted, the maximum capacity of the Facility is approximately 330,000 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. It is a property of odorous substances that make them perceptible to our sense of smell. The term odour refers to the stimuli from a chemical compound that is volatilised in air. Odour is our perception of that sensation and we interpret what the odour means. 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. Odours have the potential to trigger strong reactions for good reason. Pleasant odours can provide enjoyment and prompt responses such as those associated with appetite. Equally, unpleasant odours can be useful indicators to protect us from harm such as the ingestion of rotten food. These protective mechanisms are learnt throughout our lives. 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.

An odorant is a substance which stimulates a human olfactory system so that an odour is perceived. 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), or less in air.

The potential point source releases of odour from the Facility are the main stack which emits combustion gases from the ERF.

The potential sources of fugitive emissions of odour are:

- deliveries of waste for processing;
- the waste bunker and incoming waste storage areas; and
- the ash storage area.

3.2 Pathways

Odours released from the sources identified are emitted to air and 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 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 that is likely to generate annoyance in residential premises (i.e. people's homes) tends to be considerably lower than the levels which may generate annoyance at commercial premises, where higher tolerance to odour exposure can generally be expected. The exception being a public house, restaurant or café which have outside seating areas, and therefore are likely to have a greater sensitivity of exposure to odour than other commercial premises.

A number of sensitive receptors, including a mixture of commercial and residential receptor locations, have been identified within 1 km of the Facility as part of the Odour Sensitive Receptor Assessment. These are presented in Appendix B. These receptors were identified during planning as part of ES Chapter 4, and were selected to represent the nearest local sensitive locations in a variety of directions.

4 Odour Management and Control Measures

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

Prior to commissioning of the Facility, a commissioning plan will be submitted to the EA for approval. The commissioning plan will include the measures to be taken to prove performance of the 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 which will define the age of the waste materials imported into the Facility.
- Further details associated with the storage capacity of the waste reception bunker, the storage times associated with the storage of incoming waste will be supplied on completion of the detailed design. The detailed design information will also be used to support the development of the final OMP.
- The development of a waste acceptance criteria that limits the odour of waste received at the Facility. This will be supplemented by random monitoring of suppliers and odour monitoring of the waste to be transferred to the Facility.
- Odour parameters, odour ranges, monitoring protocols and intervention trigger levels being established within the commissioning plan.
- Design and management of ventilation systems to prevent the fugitive release of emissions from the Facility.
- Extent of building enclosure and management of the operation of access doors.
- Management of emergency situations.

4.1 Control Measures

All waste handling, transfer and treatment activities undertaken at the Facility will be undertaken within environmentally controlled buildings which will maintain negative pressure within the waste reception and handling areas, thereby minimising the potential for the release of fugitive odour emissions from the Facility.

Where appropriate, documented pre-acceptance and acceptance procedures for incoming waste will be developed to ensure that 'unacceptable' odorous wastes are not delivered to the Facility. If loads of odorous wastes are delivered to the Facility, suitable systems will be in place to ensure that the waste delivery is either rejected, or, quarantined within the Facility process building before being either returned to the waste supplier, or transferred off-site to a suitably licenced waste management facility.

In the event these control measures do not minimise the release of fugitive odour emissions, the measures detailed within the action plan (refer to section 7.2) will be implemented.

4.1.1 Receipt and Management of Wastes

All waste deliveries to the Facility will be transported in enclosed vehicles. The waste delivery vehicles will not be opened until they are within the enclosed waste reception area. This will minimise the release of fugitive odorous emissions during transport to the Facility.

Wastes for treatment within the Facility will be managed prior to delivery through waste transfer stations within the local and wider areas. Waste which will be delivered to the Facility will only be accepted if it is in accordance with the documented waste acceptance procedures.

The waste reception area will have sufficient safe areas for the inspection of waste deliveries and for the potential quarantine of any non-compliant waste.

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

The waste reception area will be maintained at negative pressure, by drawing air from these areas and supplying it into the combustion process. The resulting negative pressure within the waste reception area will ensure that odour is contained within and prevented from leaving the waste reception area. In the event that negative pressure is lost, the measures discussed in section 4.1.1.1 will be implemented.

Delivery/unloading of waste will be supervised by site operatives. If the waste is identified as being odorous/unacceptable it will be quarantined within a dedicated area and either returned to the waste producer or transferred off-site to a suitably licenced waste management facility. Investigations will be undertaken to identify the reason for malodorous materials being imported into the site with the waste supplier, and appropriate action taken to prevent a reoccurrence. The provenance and age of the waste supplied to the Facility will be monitored and managed to minimise the risk of malodorous materials being imported to the Facility.

Anaerobic conditions can lead to the generation of odorous air within the waste reception bunkers. Incoming waste delivered to the Facility will be stored in the waste reception areas for the minimum period of time to prevent the formation of anaerobic conditions within waste reception areas. The 24-hour continuous operation of the Facility will minimise the storage times for wastes within the waste bunkers. Reception areas are cleared and cleaned during normal night time operations.

Where appropriate, prior to periods of planned maintenance, all quantity of waste stored within the waste bunker will be 'run-down' so that they do not contain significant quantities of potentially odorous material during planned shutdown periods. In the event of an extended unplanned shutdown, if odour can be identified at the installation boundary, any remaining waste will be unloaded from the bunker for transfer off-site to a suitably licenced waste management facility.

In addition, to allow for periods of extended unplanned shutdown, arrangements are in place to divert incoming wastes from the Facility. It should be noted that there is no external storage of potentially odorous waste associated with the operation of the Facility.

4.1.1.1 Additional Measures During Shutdown

During periods of shutdown, all doors to the waste reception area will remain closed. This will help to contain odours within the waste reception area.

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 reception area and maintaining an ambient temperature.

During normal operation of the Facility, regular inspections will be undertaken to monitor for odour (refer to Section 5). These inspections will include monitoring for odour in the tipping hall bunker area and external boundary, 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.

If it is determined during detailed design that additional odour abatement is required within the waste reception and storage areas, a suitable system will be installed. This will be subject to detailed design.

4.1.2 Incoming Waste

Incoming waste will be transferred to the waste bunker. Allowing for stacking, the waste storage capacity of the bunker is approximately 18,000 m³, equivalent to approximately 5,000 tonnes of waste and around 5 days of waste processing capacity. The bunker size is subject to detail design by the selected EPC contractor.

If there is an extended unforeseen shutdown, the design allows for back loading of waste from the bunker to be transferred off-site to a suitably licenced waste management facility.

4.1.3 Incinerator Bottom Ash

Due to the high temperatures, any organic substances within the waste will have been destroyed within the waste incineration process. Therefore, the incinerator bottom ash (IBA) is not odorous and is managed within the confines of the Facility building in the IBA storage area.

The IBA storage facility has capacity for the storage of approximately 800 tonnes of IBA (subject to detailed design), equivalent to 4 days of IBA production assuming continuous operation at full load.

4.1.4 Air Pollution Control Residues

Due to the high temperatures, any organic substances within the waste will have been destroyed at the high temperatures within the waste incineration process. Furthermore, the ammonia dosed in the NO_x abatement system will not be dosed into the flue gas stream until after the bag filters. Therefore, the ammonia will not be present in the air pollution control residues (APCr) and will not be odorous. APCr will be stored within sealed/enclosed silo(s).

The design of the silo(s) is subject to detailed design, but it is expected that the capacity of the silo(s) will be a minimum of 5 days storage capacity assuming continuous operation at full load.

4.2 Point Source Odour Emissions

During normal operation, the point source odorous emissions from the Facility are from the main stack which emits combustion gases.

Odorous air from the waste reception and waste storage areas within the main building will be used as combustion air in the waste incineration process. The Industrial Emissions Directive (IED) requires that any combustion gases passing through an Energy Recovery Facility (ERF) must experience a temperature of 850°C or more for at least two seconds. Due to the high temperature experienced by the gases, most odorous chemicals are destroyed. Any surviving odorous chemicals may become trapped in the bag filters.

The flue gases from the ERF will pass through a flue gas treatment (FGT) system, which includes bag filters to reduce the particulate/dust content of the flue gas.

An SNCR reagent (ammonia) will be introduced into the furnace as part of the FGT process, of which there may be some 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. This has demonstrated that the impact of emissions of ammonia from the Facility can be discounted as not significant.

The release of the flue gases from the main stack assists with dispersion of the flue gases. Taking this into consideration, there will not be any malodorous air from the Facility that is detectable at sensitive receptors.

To prevent fugitive dust 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, the measures described in Sections 4.1.1 and 4.1.1.1 will be enforced.

4.3 Fugitive Emissions

Identified possible sources of fugitive emissions of odour are:

- deliveries of waste for processing at the Facility;
- from waste storage areas; and
- from IBA storage and handling; and
- from APCr storage and handling.

4.3.1 Deliveries of Waste for Processing

All waste will be delivered to the Facility in enclosed vehicles/containers, which will contain any fugitive emissions from the waste delivery vehicles/containers whilst being transferred to the waste reception areas. Wastes will not be unloaded from the waste delivery vehicles/containers until the delivery vehicles are within the fully enclosed main Facility building, and the waste delivery vehicles/containers are in the dedicated waste reception areas.

4.3.2 Waste Storage Areas

An induced draught (ID) fan will be used to maintain the waste bunker at negative pressure. This will ensure that odour is not able to escape the main building. Air from the waste bunker will be extracted and used as combustion air.

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 waste bunker, which could generate further odorous emissions.

In the event of an unscheduled shutdown, the measures described in Sections 4.1.1 and 4.1.1.1 will be implemented.

4.3.3 IBA Storage and Handling

Incinerator bottom ash (IBA) is the product of incineration of waste fuel. This means that it will have reached a temperature of 850°C or higher during combustion for at least two seconds, and that it will have a Loss on Ignition (LOI) of less than 5% or a Total Organic Carbon of less than 3%, as required by the IED. At this temperature, any organic or putrescible solid material which was presented within the waste will have been destroyed and will not be present within the IBA.

Consequently, there will be no odour from the ash storage area and the handling of the IBA will be managed within the IBA bunker within the main building.

Vehicles being used to transport IBA off site will be covered to prevent the spill of ash onto public roads. Wheel wash facilities will be provided in the IBA storage area so that IBA can be removed from the tyres prior to leaving the IBA storage area and prevent it being tracked around the internal vehicle movement areas and off-site.

4.3.4 APCr storage and handling

Air Pollution Control (APC) residues from the Flue Gas Treatment (FGT) bag filters will be collected in silos. Transfer from the bag filters to the silo will typically be via an enclosed pneumatic conveyor. Silos will be equipped with a vent fitted at the top with a fabric filter. The filter will be inspected regularly for leaks.

Transfers to specially designed road haulage vehicles will be carried out under gravity using a drop down hose, with the displaced air from the road haulage vehicles being discharged back into the silos via filters to prevent the release of dusts. Filter residues will also be returned to the silo.

Silos will be equipped with a vent fitted at the top with a fabric filter. Filter residues will be returned to the silo. Cleaning of the filter is done automatically with compressed air after the filling operation.

Licensed waste contractors will be used to transport the APCr off-site to a suitably licenced waste management facility.

5 Odour Monitoring

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

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

5.1 Visual inspections of the site

On a daily basis, visual inspections of the site will be undertaken to identify whether mud and soil has been tracked onto the site from off-site sources. This will include, but not be limited to, the road network on-site and the off-site roads in the vicinity of the site. The procedure will be detailed in the site management systems.

If required, road sweepers will be deployed to clean roadways and areas of hardstanding. Details of the visual inspections and periods when the road sweepers have been used will be recorded.

5.2 Olfactory Testing

Olfactory (sniff) testing will be undertaken at strategic locations around the installation boundary on a daily basis. Where odours at the perimeter are identified this will be reported to the site management team. An investigation on the source and root cause of the odours will be undertaken as detailed in Section 7.

5.2.1 Competent Individuals

In order to ensure repeatability of the results, more than one competent odour assessor/member of staff will be on-site at all times. This will ensure that odour monitoring will continue in the event that one individual is unavailable. Furthermore, as colds, sinusitis or sore throats can affect the sense of smell, having more than one trained individual will allow the monitoring to continue in the event of illness. However, if all individuals are suffering from illness etc then this fact will be clearly recorded on the odour monitoring forms. The number of trained individuals available at any one time will not exceed four people in order to maintain the consistency of the results.

It will be important that these individuals do not spend or have not spent significant time in waste processing areas, as the testers sense of smell must not have become accustomed to the odours arising. The individuals undertaking the monitoring should avoid strong foods or drinks (including coffee) for at least half an hour before conducting the monitoring. Furthermore, strongly scented toiletries and the use of deodorisers within vehicles will be avoided.

5.2.2 Monitoring Locations

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

5.2.3 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 that a detailed dataset will be maintained throughout the year.

Monitoring will be undertaken upon receipt of a complaint in order to identify and record the odours present at the time of the complaint. Refer to Section 7.

The strategy will be flexible; therefore, monitoring will not be conducted at a set time of day. Instead the monitoring will be conducted when there will be a high risk of odour generation, i.e. during times where there are waste deliveries to the site or residues being transferred from the site, and not when there will be relatively little risk of odour generation.

5.2.4 Data collection and recording

Before starting the odour monitoring the individual will record all pertinent details, such as date, time, weather conditions and activities being undertaken. This has been summarised within a proposed monitoring template contained within Appendix D.

In order to quantify the 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 respectively.

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)
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 odour will also be recorded, such as persistence, transience and potential source etc.

5.2.5 Action Limits

If a score of 1 is recorded for Odour Intensity and Odour Offensiveness at a monitoring location, odour from the Facility cannot be detected and no action will be required.

If monitoring locations score a 2 or higher for Odour Intensity or score a 2 or higher for Odour Offensiveness, then a more detailed investigation into the activities being undertaken and the root cause of the odour will be investigated, refer to section 7.1. This approach will attempt to identify

the source of the odour and suggest possible ways to improve operations at the Facility to prevent odour being generated from on-site activities.

5.2.6 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 presents possible abnormal events, and planned responses in the event of these occurrences. 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 diverted to an alternative waste treatment facility.

Table 3: Abnormal Events and Response Measures

Event	Location	Likely Effect	Response Measures	Timescales for Response
Failure of an ID fan	ERF	Increased odours within the Tipping Hall and reception areas.	Maintenance engineers sent to rectify the failure.	Immediate
			ERF operations suspended until the problem will be rectified. Waste diverted to an alternative waste treatment facility.	One day
			Waste unloading operations from the bunker will commence.	One week
Development of anaerobic conditions in waste storage areas	ERF tipping area	Increase in odour within the ERF tipping area and reception areas.	Wastes are removed on a first-in, first-out principle and during operation the waste will be regularly mixed to avoid the development of anaerobic conditions.	Ongoing
Bag filter failure	FGT area	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

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. A wind direction towards sensitive receptors may increase odour levels. Conversely very low wind strength and temperature inversions may minimise dispersion and potentially create a build-up of odour. Elevated climatic temperatures during summer months may also increase odorous emissions.

Contingency mitigation measures will be developed as part of the detailed design, construction and commissioning of the Facility. This will include an emergency plan for flooding and the procedures to be implemented in case of flooding.

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 the failure of 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 actions that are likely to cause elevated levels of odour, GERL will contact the EA and any other relevant stakeholders in advance to inform them of the operations being undertaken and that the elevated levels of odour will be of a temporary nature. Where practicable, such actions 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 at the site will be logged in the sites documented management systems. The EA will be informed as soon as possible 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, localised odour monitoring will be undertaken in the area from which the complaint is received in order to assess the presence of any odours in the area where the complaint has originated from. 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 operation 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; and the building ventilation) functioning properly?
 - Are there any ‘unusual’ activities being undertaken at the Facility?
- If the 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 source of the odour emissions.
- Once the cause of the odour has been established, 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.
- GERL will 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 off-site impacts; and
- significant odour is detected off-site during 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 receipt of highly odorous waste in the waste reception areas and the closure of all doors until the wastes are processed or removed from site.
 - Suspension of future receipt of the waste stream until it has been confirmed to be acceptable.
 - 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 GERL 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

Table 4: Odour Sensitive Receptors within 1km of the Facility

Ref	Receptor	Type	Approximate Distance/ Direction from Installation Boundary	Comments
O1	Costa Coffee Shop	Commercial	325m E/NE	Considered a moderately sensitive receptor. Location is reasonably close to the Facility, however odorous emissions from the installation will be limited and mitigated against. In a direction from the Facility that will be infrequently downwind, hence pathway ineffective.
O2	Residential Property on Yorkshire Gardens	Residential	450m NW	Residential receptors are considered more sensitive to odour due to higher likelihood of generating annoyance. In a direction from the Facility that will be frequently downwind, thus pathway considered moderately effective.
O3	Residential Property on Elm Road	Residential	900m W/SW	Residential receptors are considered more sensitive to odour due to higher likelihood of generating annoyance. In a direction from the Facility that will be infrequently downwind, hence pathway ineffective.
O4	Subway Restaurant	Commercial	325m E	Considered a moderately sensitive receptor. Location is reasonably close to the Facility, however odorous emissions from the installation will be limited and mitigated against. In a direction from the Facility that will be frequently downwind, thus pathway considered moderately effective.
O5	Residential Property on Berkshire Gardens	Residential	525m NW	Residential receptors are considered more sensitive to odour due to higher likelihood of generating annoyance. In a direction from the Facility that will be infrequently downwind, hence pathway ineffective.
O6	Residential Property on Ravenhead Road	Residential	725m W	Residential receptors are considered more sensitive to odour due to higher likelihood of generating annoyance. In a direction from the Facility that will be infrequently downwind, hence pathway ineffective.
O7	Residential Property on Heathfield Avenue	Residential	550m S/SW	Residential receptors are considered more sensitive to odour due to higher likelihood of generating annoyance. In a direction from the Facility that will be infrequently downwind, hence pathway ineffective.

Ref	Receptor	Type	Approximate Distance/ Direction from Installation Boundary	Comments
O8	Residential Property on Sherdley Road	Residential	350m S/SE	Residential receptors are considered more sensitive to odour due to higher likelihood of generating annoyance. In a direction from the Facility that will be infrequently downwind, hence pathway ineffective.
O9	McDonald's Restaurant	Commercial	600m E/SE	Considered a moderately sensitive receptor. Location is a reasonable distance away from the Facility. Odorous emissions from the installation will be limited and mitigated against. In a direction from the Facility that will be frequently downwind, thus pathway considered moderately effective.

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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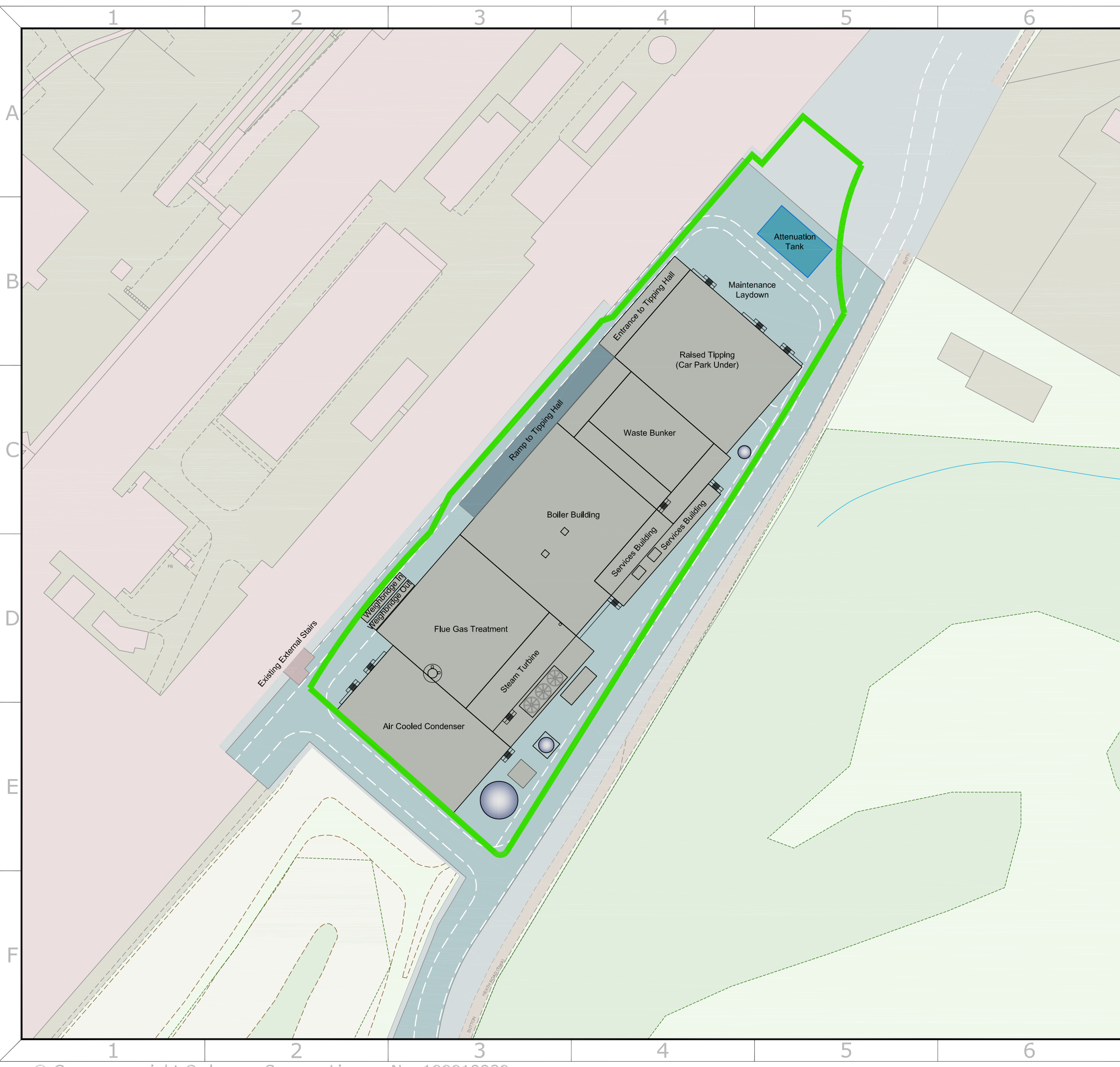
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KEY
— INSTALLATION BOUNDARY

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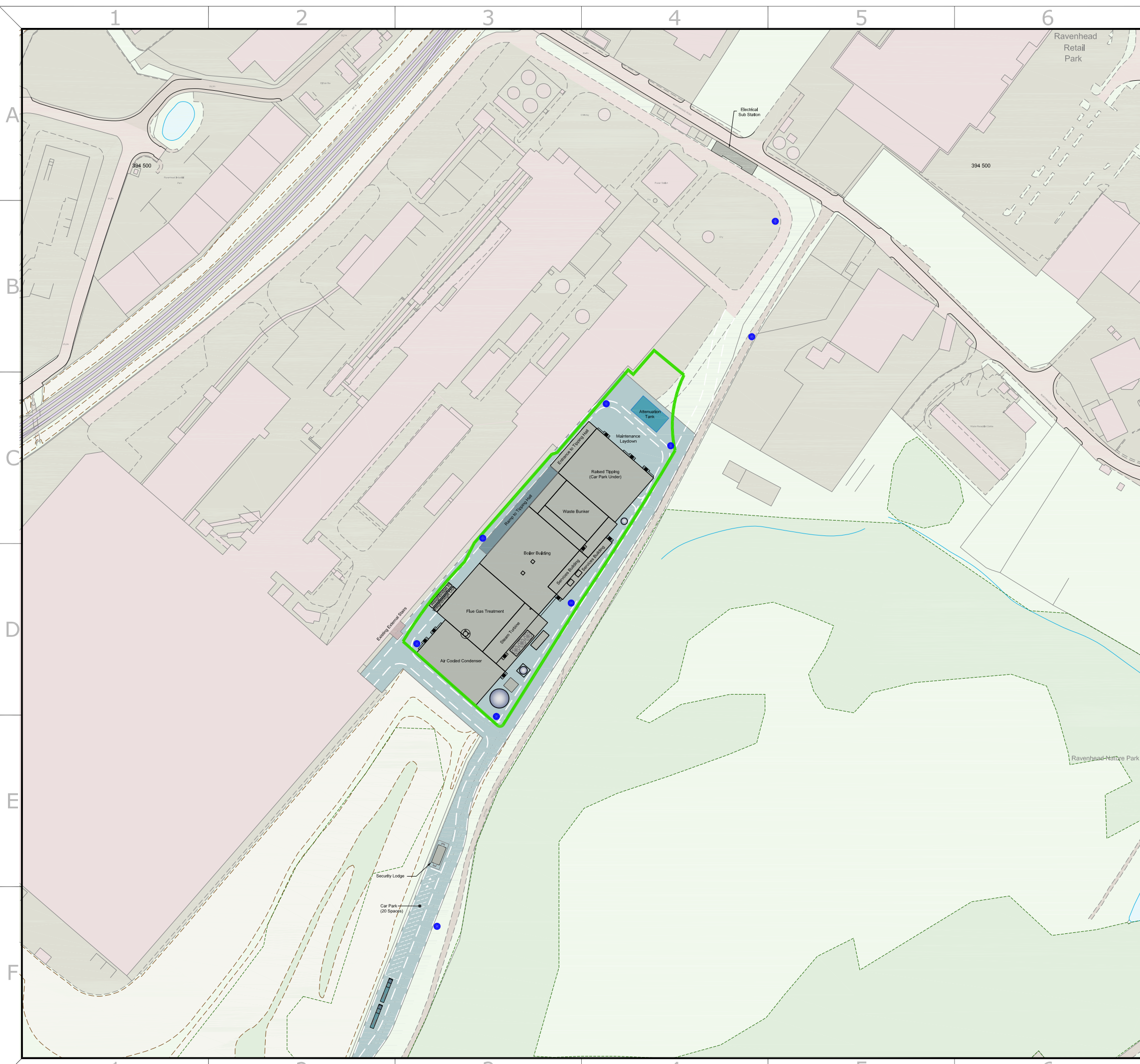
PROJECT: **EP APPLICATION**

TITLE: **INSTALLATION BOUNDARY**

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KEY

	INSTALLATION BOUNDARY
	APPROXIMATE LOCATIONS OF ODOUR MEASUREMENT

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SITE: **GREENGATE ENERGY RECOVERY FACILITY**
PROJECT: **EP APPLICATION**
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