PROPOSED USE OF LAND AND BUILDING FOR AN ANAEROBIC DIGESTION FACILITY ACCEPTING SPECIALISED DIFFICULT-TO-TREAT LIQUID WASTE, FOG CONVERSION/PRE-TREATMENT UNIT AND RESEARCH AND DEVELOPMENT FACILITY

UNIT 12B EARSTREES ROAD, EARLSTREES INDUSTRIAL ESTATE, NORTHAMPTONSHIRE, NN17 4AZ

WASTE4GENERATION (W4G)
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1 INTRODUCTION

1.1 Introduction

1.1.1 This planning statement is submitted to Northamptonshire County Council on behalf of Waste4generation (W4G) (the Applicant) in conjunction with a planning application seeking planning permission for a Research and Development (R&D) Anaerobic Digestion (AD) facility at Unit 12B Earlstrees Road, Earlstrees Industrial Estate, Northamptonshire, NN17 4AZ.

1.1.2 The proposed AD facility will take in specialised liquid food waste, such as fats, oils and greases (FOG’s). Through anaerobic digestion, the feedstocks produce biogas and clean liquid. The gas will be used in the CHP units in order to produce electricity. This will be fed into the local distribution network, or be provided directly to nearby industries. The process is entirely enclosed from start to finish in order to comply with appropriate regulations.

1.1.3 The application is supported by the following documents and drawings:
- Planning Form
- Planning Statement
- Site Location Plan – GPP/W4G/C/14/01
- Site Plan - GPP/W4G/C/14/02
- Site Layout Plan - GPP/W4G/C/14/03
- Building Elevations - GPP/W4G/C/14/04
- Photograph Panel - GPP/W4G/C/14/05
- Catchment Area Plan - GPP/W4G/C/14/06

1.1.4 Northamptonshire County Council’s Validation Checklist is included in Appendix 1. Compliance, as appropriate, is identified in the list.

1.2 The Site and its Surroundings

1.2.1 12B Earlstrees Road is located on the Earlstrees Industrial Estate on the north edge of Corby. The site is approximately 0.25 hectares in size and is comprised of a modern semi-detached industrial/ warehouse unit with a secure side and rear yard and private parking. The nearest residence is located approximately 420 metres west of the site. There is good access to the strategic highway network via the A6003, A14, A427 and A423.

1.2.2 The two neighbours are:
- 12a Earlstree Road Livingspace Ltd - Conservatories, panelling etc
- 13a Earlstree Road St Gobain Ltd - Plastics & Polymers

1.3 Planning History

1.3.1 The units on Earlstrees Road were built in the 70s or 80s. Since then Unit 12b Earlstrees road has been used for industrial B1/B2/B8 use. Examples of previous uses include the following:
- Storage and processing of mezzanine floors.
- Storage and processing of carriage seats.
- Storage and processing of windows.
1.4 Waste4Generation Information and Ethos

1.4.1 Waste4Generation provide a sustainable solution to all difficult-to-treat waste streams, such as fats, oils and greases (FOGS). These waste streams are often discharged to the sewer and have no commercial value; they cause significant blockages and deterioration of the sewerage network leading to environmental incidents that incur substantial additional costs in treatment. W4G look to treat this waste to harness its potential energy and calorific value and to reclaim valuable nutrient and mineral resources for other bioprocesses.

1.4.2 W4G will identify customers with problematic waste streams for on-site feasibility studies utilising its demonstration plant. It will also conduct feasibility studies utilising the reactors at the proposed site, where waste is transported the site for an extended period usually (3-6 months), dependent on waste streams to establish:
   • Waste feasible for AD
   • Pre-treatment requirements
   • Performance
   • Plant size
   • Operator training
   • Potential for an onsite facility at the supplier's premises.
   • Detailed proposal

1.4.3 W4G pride themselves on their sustainable business ethics. Full details of W4G’s company ethic and mission statement can be found in Appendix 2.

1.5 Site Selection and History

1.5.1 W4G is seeking to develop a suitable site in Northamptonshire for an Anaerobic Digestion (AD) facility. W4G has already discounted a site on an industrial estate at Eldon Close, Crick due to planning policy conflict with the waste spatial strategy.

1.6 Environmental Impact Assessment

1.6.1 The EIA Regulations set out descriptions of Schedule 1 developments for which Environmental Impact Assessment (EIA) is mandatory and a list of Schedule 2 developments for which an EIA may be required. An assessment of whether the proposed development falls within Schedules 1 or 2 is set out below.

1.6.1 Schedule 1 identifies twenty different categories of development in which an Environmental Impact Assessment is mandatory. The proposed processing facility is not listed as Schedule 1 development.

1.6.2 For the avoidance of doubt, the proposed AD facility will recycle specialist liquidised food waste and will not incinerate or chemically treat it. In addition, it will not deal with any hazardous waste.

1.6.3 Having regard to Schedule 2 of EIA Regulations, the proposed AD facility is described in Column 1 under section 11 (b) Installations for the disposal of waste. The proposal is therefore schedule 2 development as it processes waste and is approximately 0.3 hectares. The primary purpose of the site will be waste recycling not disposal.
1.6.4 Section A36 of the circular 02/99: Environmental Impact Assessment advice in relation to Installations for the disposal of waste states that

The likelihood of significant effects will generally depend on the scale of the development and the nature of the potential impact in terms of discharges, emissions or odour. For installations (including landfill sites) for the deposit, recovery and/or disposal of household, industrial and/or commercial wastes (as defined by the Controlled Waste Regulations 1992) EIA is more likely to be required where new capacity is created to hold more than 50,000 tonnes per year, or to hold waste on a site of 10 hectares or more. Sites taking smaller quantities of these wastes, sites seeking only to accept inert wastes (demolition rubble etc.) or Civic Amenity sites are unlikely to require EIA.

1.6.5 As the proposed development will process less than 50,000 tonnes of waste per year and the site is significantly less than 10 hectares, at 0.3ha, it is suggested that the development should not require an EIA.

1.7 Environmental Permit

1.7.1 Waste4Generation will prepare and submit a bespoke Environmental Permit to the Environment Agency if planning permission is secured for the site.
2 THE PROPOSED DEVELOPMENT

2.1 Overview

2.1.1 The proposed development has three elements. These are described briefly below.
- Pre-treatment and Research and Development – W4G identify the best pre-treatment process for their clients’ difficult to treat liquid waste. The development will allow W4G to test the optimum pre-treatment of their clients’ difficult to treat waste to make it suitable for anaerobic digestion. These wastes are typically difficult to treat or use in anaerobic digesters and often end up in landfill. This will enable W4G to optimise the plant design for clients’ sites elsewhere, through continuous research to develop smaller, more efficient processes.
- Anaerobic Digestion – It is proposed that there will be 6 x anaerobic digesters on the site. The digesters will be operated either in parallel or series depending on the current client’s requirements.
- Provide a base for W4G to carry out their administrative activities.

2.1.2 Details of the proposed development are supported by the following drawings:
- Site Location Plan – GPP/W4G/C/14/01
- Site Plan - GPP/W4G/C/14/02
- Site Layout Plan - GPP/W4G/C/14/03
- Building Elevations - GPP/W4G/C/14/04
- Photograph Panel - GPP/W4G/C/14/05
- Catchment Area Plan - GPP/W4G/C/14/06

2.2 Site Operations and Process Description

2.2.1 A copy of the process flow diagram which shows the site operations and process description for the development is included in Appendix 3. A written description of the development is included below.

Delivery and Inputs

2.2.2 The specialised difficult to treat liquid waste will be delivered in tankers to the site. Traffic movements associated with importing waste would equate to approximately 5 tankers per day (5 in and 5 out).

Inputs

2.2.3 Typical inputs would include:
- Fats, oils and greases (FOGs)
- Fruit wastes
- Distillery wastes
- Pharmaceutical wastes (non-hazardous) e.g. shaving foam
- Liquid sauces
- Fat trap wastes
- Milk, dairy wastes, whey
- Bloods
- Fruit solids
- Liquid food waste
- Bio-diesel waste and Glycerine
• Brewery and distillery wastes.

Pre-treatment and Research and Development

2.2.4 The feasibility study on each individual difficult to treat waste stream allows W4G to determine the following:
• The type of process required
• Whether the waste will need to be put through the AD facility in series or parallel
• The cost of treatment
• Pre-treatment requirements
• The removal rates, efficiency and methane percentage
• The recoverable commodities
• The viability of waste treatment at source
• Biogas utilisation in other processes such as Liquid Natural Gas (or Liquid Biomethane) or methanol production.

2.2.5 Through conducting in-house analysis and in-depth feasibility studies on the potential waste streams, W4G can confidently:
• Optimise processes of different waste streams
• Establish if the waste is suitable/feasible for anaerobic digestion
• Determine the composition of the waste and if it is viable for nutrient/mineral recovery
• Determine if the waste can be pre-treated in order to increase digestibility for anaerobic digestion or be utilised for biodiesel production.
• The Waste4Generation pre-treatment process (hydrolysis) converts the liquid into a desirable feedstock for anaerobic digestion. For example, one tonne of FOG can be converted into 3 tonnes of soluble chemical oxygen demand (COD) as a viable feedstock for anaerobic digestion. The soluble COD produced can either be utilised for anaerobic digestion, or the pre-treatment process can be halted at the optimum carbon chain length for biodiesel manufacture.

Anaerobic Digestion Process

2.2.6 The Waste4Generation high-rate anaerobic digestion (AD) equipment is designed to treat more complex liquid waste streams, with the proposed system treating waste within 24 hours. The system will be designed to incorporate nutrient recovery, recovering in particular, phosphorus. W4G’s AD technology exceeds the performance of any other AD plant current in operation or being developed. (95+% removal rates & 80+% methane).

2.2.7 High-rate AD is the most efficient treatment process for these types of wastes, converting the liquid waste into gas, leaving a cleaned liquid for discharge to the sewer. The system produces a high quality biogas with over 80% methane content. The plant itself will have minimal waste storage, with all waste being processed well within 24 hours of its arrival on-site. There will be no gas storage on site, and no co-digestion of different wastes, with individual reactors operating to achieve maximum biogas yield from each waste stream in the process.

2.2.8 The high-rate AD process itself is a proven technology. Orchard House Foods in Corby is now managed by Waste4Generation (since March 2014), demonstrating the viability and reliability of a small footprint AD plant with no detrimental environmental impact (such as odour). The process is carefully controlled through safe and efficient automated operations with closely monitored key performance indicators and plant conditions. The process parameters are continuously monitored and controlled to optimise the system efficiency and to eliminate any
potential H2S production. The two-stage AD process is proven and patent pending along with the pre-treatment process.

**Feedstock Quantities**

2.2.9 The facility will process 40,000 tonnes per annum of specialised liquid waste. Liquid waste is heavy, so it should be remembered that in comparison to an AD facility taking in a similar tonnage of solid waste, this provides much less nutrient input. There will be no digestate produced, the cleaned liquid will be discharged straight to the sewer.

**Outputs**

- There will be no vehicle movements generated from tankering digestate offsite; the cleaned liquid will be discharged straight to the sewer.
- Concentrated liquid feedstock for anaerobic digestion for utilisation either at a W4G AD plant or supplied to an alternative AD plant; this is likely to generate one tanker load per day.
- Feedstock for biodiesel generation and nutrient recovery; this may generate one tanker load per day.
- Biogas from the anaerobic digestion process (to be used either for electrical production, heat generation, methanol production, biogas injection or production of biomethane fuel).
- Renewable heat and electricity
- The equipment produces only a low strength liquid waste in the form of an effluent, that causes no environmental impact. This is a cloudy water which is discharged directly to the sewer (reducing loading on local sewage treatment works).

**Hours of Operation**

**Reception of Feedstock**

2.2.10 With the exception of emergencies, the deliveries of feedstock will take place between the following hours:
- 07.00 to 18.00 Monday to Friday inclusive
- 07.00 to 18.00 Saturdays
- 07.00 to 18.00 Sundays and Bank Holidays

**Feedstock Processing**

2.2.11 The AD facility will process feedstock as necessary, in some cases this will be 24 hours a day.

**Storage of Material**

2.2.12 The following materials will be stored on site:
- Feedstock/ liquid waste - Received from tanker into reception tanks (storage of no more than 24 hours prior to processing)
- Fuel Oil - For the initial heating of the plant, shall be stored in a bunded oil storage tank
- Effluent/ Treated waste - disposed directly to drain (no storage)
- Sodium Hydroxide - stored in bunded, heated chemical tank
- Ferric Chloride - to be stored in either a bunded chemical storage tank or within an intermediate bulk container (IBC) bund.
- Sodium Hypochlorite - to be stored in IBC’s (as delivered) in IBC bund.
- Hydrogen Peroxide - to be stored in IBC’s (as delivered) in IBC bund.
- Trace micro-nutrients - to be stored in IBC’s (as delivered) in IBC bund.
2.3 Vehicle Numbers and Parking

2.3.1 Traffic movements associated with importing waste would equate to approximately 10 tankers per day (10 in and 10 out). Approximately 6 staff will be employed on site and so there will be 12 movements per day associated with staff vehicles.

2.3.2 There are 11 car parking places on site as indicated on Site Layout Plan GPP/W4G/C/14/03.

2.4 Fire Risk

2.4.1 Fire risk is low due to it being a largely wet process. Fire extinguishers will be stored on site for use in the event of a fire. These will be stored at all entrances to the building and tested every 2 months to ensure they are fully functional.

2.5 Lighting Scheme

2.5.1 The position of all external lighting is shown on Drawing GPP/W4G/C/14/04. Exterior lighting will be confined to downward facing low-energy lights mounted on the building. Any additional lighting will be agreed with Northamptonshire County Council prior to instillation in order to protect local amenity.

2.6 Site Security

2.6.1 There are two sets of locked gates to the site, one gate situated on the side of the property, and a further gate to the back yard area. The property has an existing alarm & CCTV system to be reconnected. The Site and the back yard are surrounded with security lighting.

2.7 Grid Connection

2.7.1 W4G have an initial agreed export connection of 50 kWh electrical export capacity with Western Power.

2.8 Employment and the Local Economy

2.8.1 It is anticipated that the facility will generate around 6 full time jobs.

2.8.2 In addition to generating direct employment opportunities at the site, it is envisaged that a number of indirect and induced jobs will be created, because of the need to service the site. Typically, these relate to the provision of a wide variety of goods and services, including specialist engineering assistance for plant maintenance.

2.8.3 The facility will thus provide beneficial socio-economic effects through the generation of additional local employment opportunities and economic activity.
3 PLANNING POLICY CONTEXT

3.1 Introduction

3.1.1 The main objectives and planning policies that are relevant to the proposal are set out below. Section 38(6) of the Planning and Compulsory Purchase Act 2004 states that determination of a planning application must be made in accordance with the Development Plan unless material considerations indicate otherwise.

3.1.2 In reaching a decision on this planning application, the first consideration is therefore whether the proposal is in accordance with the Development Plan. Having done this it is then necessary to have regard to all other material planning considerations, which include National Planning Policy Guidance.

3.1.3 This chapter provides an indication of the main Development Plan policies and national planning guidance that has been considered and assessed in the preparation of this planning application.

3.1.4 The Development Plan in this instance consists of:
- Northamptonshire Minerals and Waste Local Plan (October 2014)

3.1.5 The main objectives and planning policies that are relevant to the proposal are set out below.

3.2 The Development Plan

Northamptonshire Minerals and Waste Local Plan (October 2014)

3.2.1 Policy 11: Northamptonshire’s waste management capacity

The development of a sustainable waste management network to support growth and net self-sufficiency within Northamptonshire will involve the provision of facilities to meet the following indicative waste management capacity requirements during the plan period:

<table>
<thead>
<tr>
<th>Hierarchy level</th>
<th>Management method</th>
<th>Indicative capacity requirement (million tonnes per annum)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>2021</td>
</tr>
<tr>
<td>Preparing for re-use</td>
<td>Recycling (non-inert)</td>
<td>0.26</td>
</tr>
<tr>
<td>and recycling</td>
<td>Composting and anaerobic digestion</td>
<td>0.17</td>
</tr>
<tr>
<td></td>
<td>Inert recycling</td>
<td>0.74</td>
</tr>
<tr>
<td></td>
<td>Hazardous recycling</td>
<td>0.02</td>
</tr>
<tr>
<td>Other recovery</td>
<td>Advanced treatment</td>
<td>0.86</td>
</tr>
<tr>
<td></td>
<td>Hazardous treatment</td>
<td>0.01</td>
</tr>
<tr>
<td></td>
<td>Inert fill or recovery</td>
<td>0.16</td>
</tr>
</tbody>
</table>

This provision will come from a mix of extensions to existing sites, intensification or re-development of existing sites and new sites, providing they all meet the spatial strategy for waste management and are assessed as meeting environmental, amenity and other requirements. Allocations for waste development will also contribute to meeting this provision.
3.2.2 Policy 12: Spatial strategy for waste management

Northamptonshire’s waste management network, particularly advanced treatment facilities with a sub-regional or wider catchment, will be focused within the central spine and the sub-regional centre of Daventry. Development should be concentrated in Northampton, Wellingborough, Kettering, Corby and Daventry. Development in the smaller towns should be consistent with their local service role.

Facilities in urban areas should be co-located together and with complementary activities.

3.2.3 Policy 13: Development criteria for waste management facilities:

Proposals for waste management facilities on non-allocated sites (including extensions to existing sites and extension to allocated sites) must demonstrate that the development:

- Does not conflict with the spatial strategy for waste management;
- Promotes the development of a sustainable waste network and facilitates delivery of Northamptonshire’s waste management capacity requirements;
- Clearly establishes a need for the facility identifying the intended functional role, intended catchment area for the waste to be managed, market base for any outputs, and where applicable the requirement for a specialist facility;
- Is in general conformity with the principles of sustainability (particularly regarding the intended catchment area);
- Facilitates the efficient collection and recovery of waste materials; and
- Where intended for use by the local community, is readily and safely accessible to those it is intended to serve.

3.2.4 Policy 16: Industrial area locations for waste management uses (inter alia)

WL16: Corby – Earlstrees

3.2.5 Policy 19: Development criteria for waste disposal (non-inert and hazardous)

Proposals for the disposal of non-inert or hazardous waste must demonstrate that:

- additional capacity is needed to deliver waste disposal capacity requirements,
- it clearly establishes a need for the facility identifying the intended functional role, intended catchment area for the waste to be disposed and where applicable the requirement for a specialist facility,
- it is in general conformity with the principles of sustainability (particularly regarding the catchment area),
- the waste to be disposed of has undergone prior-treatment to ensure that only residual waste is disposed of, and
- disposal forms the last available management option.

Where this can be demonstrated, preference will be given to extensions of existing sites unless it can be shown that a standalone site would be more sustainable and better located to support the management of waste close to its source.

3.2.6 Policy 22: Addressing the impact of proposed minerals and waste development:

Proposals for minerals and waste development must demonstrate that the following matters have been considered and addressed:

- Protecting Northamptonshire’s natural resources and key environmental designations (including heritage assets);
• Avoiding and / or minimising potentially adverse impacts to an acceptable level, specifically addressing air emissions (including dust), odour, bioaerosols, noise and vibration, slope stability, vermin and pests, birdstrike, litter, land use conflict and cumulative impact;
• Impacts on flood risk as well as the flow and quantity of surface and groundwater;
• Ensuring built development is of a design and layout that has regard to its visual appearance in the context of the defining characteristics of the local area;
• Ensuring access is sustainable, safe and environmentally acceptable, and
• Ensuring that local amenity is protected.

3.2.7 Policy 23: Encouraging sustainable transport
Minerals and waste related development should seek to minimise transport movements and maximise the use of sustainable or alternative transport modes. Where possible minerals and waste related development should be located, designed and operated to enable transport by rail, water, pipeline or conveyor.

Minerals and waste related development should be well placed to serve their intended markets or catchment area(s) in order to reduce transport distances and movements in order to support the development of sustainable communities that take responsibility for the waste that they produce and work towards self-sufficiency.

Proposals for new development or development that would result in a significant increase in transport movements should include a sustainable transport statement to demonstrate how the above has been taken into consideration.

3.2.8 Policy 24: Natural Assets and resource:
Minerals and waste development should seek to achieve a net gain in natural assets and resources, through:
• Protecting and enhancing international and national designated sites;
• Delivery of wider environmental benefits in the vicinity where development would adversely affect locally designated sites or other features of local interest;
• Protecting and enhancing green infrastructure and strategic biodiversity networks, in particular the River Nene and other sub-regional corridors; and
• Contributing towards Northamptonshire Biodiversity Action Plan targets for habitats and species.

Proposals for minerals and waste development will be required to undertaken an assessment (where appropriate) in order to:
• Identify and determine the nature, extent and level of importance of the natural assets and resources, as well as any potential impacts, and
• Identify mitigation measures and / or requirement for compensation (where necessary) to avoid, reduce and manage potentially adverse impacts.

3.2.9 Policy 25: Landscape character:
Minerals and waste development should seek to reflect Northamptonshire’s landscape character. Development should mitigate potentially adverse impacts on the local character and distinctiveness of Northamptonshire’s landscape where necessary during the development, operational life, restoration, aftercare and after-use. Opportunities for enhancement should be maximised through restoration, aftercare and after-use.
Proposals for minerals and waste development will be required to undertake a landscape impact assessment (where appropriate) based on the landscape character assessment in order to identify:

- The presence of landscape values (including their nature, extent and level of importance) and determine any potential impacts.
- Any necessary measures to mitigate potentially adverse impacts; and
- Opportunities to protect and enhance particular features that create a specific interest of local distinctiveness or character.

3.2.10 Policy 27: Layout and design quality:

The layout and overall appearance of waste management facilities, and where appropriate minerals development, will be required to demonstrate that the development:

- Supports local identity and relates well to neighbouring sites and buildings;
- Is set in the context of the area in which it is to be sited in a manner that enhances the overall townscape, landscape or streetscape (as appropriate);
- Utilises local building materials as appropriate;
- Incorporates specific elements of visual interest; and
- Builds-in safety and security.

3.3 Other Material Considerations

National Planning Policy for Waste (October 2014)

3.3.1 Identifying suitable sites and areas:

Paragraph 5: Waste planning authorities should assess the suitability of sites and/or areas for new or enhanced waste management facilities against each of the following criteria:

- The extent to which the site or area will support the other policies set out in this document;
- Physical and environmental constraints on development, including existing and proposed neighbouring land uses, and having regard to the factors in Appendix B to the appropriate level of detail needed to prepare the Local Plan;

3.3.2 Determining planning applications:

Paragraph 7: When determining waste planning applications, waste planning authorities should:

- Consider the likely impact on the local environment and on amenity against the criteria set out in Appendix B...
- Ensure that waste management facilities in themselves are well-designed, so that they contribute positively to the character and quality of the area in which they are located.

National Planning Policy Framework (March 2012)

3.3.3 The National Planning Policy Framework was published on the 27th March 2012 and came into force immediately with respect to plan and decision making. The NPPF states at paragraph 5 of its introduction that it does not contain specific waste policies 'since national waste planning policy will be published alongside the National Waste Management Plan for England' However, paragraph 5 goes on to say that local authorities should have regard to the policies in the National Planning Policy Framework in preparing their waste plans.
3.3.4 The Framework provides a presumption in favour of development with sustainable credentials. Paragraph 14 of the Framework states:

At the heart of the planning system is a presumption in favour of sustainable development, which should be seen as a golden thread running through both plan making and decision taking. For decision-taking this means:

- Approving development proposals that accord with the development plan without delay; and
- Where the development plan is absent, silent or relevant policies are out of date, granting planning permission unless:
  - Any adverse impacts of doing so would significantly and demonstrably outweigh the benefits, when assessed against the policies in this Framework taken as a whole; or
  - Specific policies in this Framework indicate development should be restricted.


3.3.5 The Waste Framework Directive sets the basic concepts and definitions related to waste management, such as definitions of waste, recycling and recovery. It requires that waste be managed without endangering human health and harming the environment and without adversely affecting the countryside or places of special interest.
4 ASSESSMENT OF THE PROPOSAL

4.1 Introduction

4.1.1 The starting point for the assessment of this proposal is the Development Plan. From an assessment of the pertinent Development Plan policies and other material planning considerations the ‘main’ issues in the determination of this planning application are considered to be:

- The Location of the Development
- Compliance with NCC’S Capacity Targets
- Compliance with the Waste Hierarchy
- Need
- The Catchment Area
- Compliance with Energy Policy
- The Sustainability Credentials Associated with the Development
- Environmental Considerations

4.2 The Location of the Development

4.2.1 Policy 12 of Northamptonshire County Council’s Local Plan (2014) sets out the spatial strategy for waste development in the County. It sets the aspiration that advanced treatment facilities should be located within the central spine, as shown on Plan 6. Corby is located within the central spine and is specified in Policy 12 as one of the areas that waste management development should be concentrated. Therefore, the proposed development is compliant with Policy 12 of Northamptonshire County Council’s Local Plan (2014).

4.2.2 The proposed development is located within an allocated industrial area, as outlined by Policy WL16. Policy 16 states that this location is acceptable in principle for those waste management uses appropriate to be located in an urban area. All environmental considerations are considered in Section 4.9. None of these environmental impacts are considered to be unacceptable and therefore the development is considered to be appropriate for an urban location. The nearest residential dwelling is located 420 metres south-west of the site and therefore it is considered that there is a reasonable buffer between the development and this location. For these reasons, the development is considered to be compliant with Policy 16 of the Waste Local Plan (2014).

4.2.3 The National Planning Policy for Waste (October 2014) provides added support for locating waste management operations on industrial estates. There is excellent access to the strategic highway network via the A6003, A14, A427 and A423 to the site.

4.2.4 Waste4Generation manage another site on the Earlstrees Industrial Estate. There are therefore significant benefits in terms of resource management for the concentration of their activities on the Earlstrees Industrial Estate.

4.3 Compliance with NCC’s Capacity targets

4.3.1 Policy 11 of Northamptonshire’s Local Plan (2014) sets out Northamptonshire’s waste management capacity, categorised by functional role. The definition of the functional roles is
provided in the supporting text on page 59 of the Local Plan. Anaerobic digestion (without energy recovery) is categorised as preliminary treatment. As this facility will recover energy from the anaerobic digestion process, it is considered to fit better into the advanced treatment category under “other waste to energy processes” or “other emerging advanced technologies”.

4.3.2 The indicative capacity target set for advanced treatment facilities is 820,000 tonnes per annum by 2021. The supporting text states in paragraph 5.36 that "sufficient allocated sites and industrial locations have been identified through the plan to accommodate the development of facilities to meet the capacity gap by 2021.” This site is within an allocated industrial area. It will contribute 40,000 tonnes per annum towards filling this capacity gap. The development is therefore compliant with Policy 11 as it will help NCC meet their capacity targets.

4.3.3 It is assumed that the facility is classified as advanced treatment. However, policy 11 also offers capacity targets for anaerobic digestion facilities. The indicative capacity target set for composting and anaerobic digestion facilities is 170,000 tonnes per annum by 2021. This facility will treat specialised and difficult to treat liquid wastes and is therefore different from typical AD facilities. It will therefore not be competing with the existing facilities within the county and may even act as an enabler to other facilities, as the facility can pre-treat waste prior to being used in an anaerobic digester elsewhere. The development is therefore compliant with Policy 11.

4.4 Compliance with the Waste Hierarchy

4.4.1 National and local waste planning policies require waste management to be moved up the waste hierarchy, away from disposal to landfill. This facility will treat a range of difficult to treat liquid wastes. As these wastes are difficult to treat, they are often sent to landfill. For example, FOGs are currently dislodged from the sewer system, where if left they would cause blockages. The FOGs are then taken to landfill. Waste4Generation will employ a contractor who will dislodge the FOGs from the sewer system, and bring them into the site in a suspended state. The FOGs will then be pre-treated in order to make them the optimum consistency to be put through the anaerobic digestion process, where gas and then electricity will be produced. This proposed facility therefore drives the management of difficult to treat liquid wastes up the hierarchy and diverts it from landfill.

4.4.2 All of W4Gs proposed inputs are undesirable residues from other processes where if left would otherwise go to landfill.

4.5 Need

4.5.1 Paragraph 98 of the NPPF provides that local planning authorities should "not require applicants for energy development to demonstrate the overall need for renewable of energy ... and also recognise that even small-scale projects provide a valuable contribution to cutting greenhouse gas emissions.”

4.5.2 Notwithstanding the above, there is a strong need for this facility. The facility will treat fats, oils and greases (FOGs) recovered from the sewerage system but also other waste streams see – 2.5.2. These are very specialised types of waste. FOG waste causes significant blockages and deterioration of the sewerage network leading to environmental incidents that incur substantial additional costs in treatment, remediation and repair at the expense of the taxpayer. Waste4Generation will treat this waste from a catchment area mostly within Northamptonshire.
This will improve the condition of the sewerage system and harness the potential energy and calorific value and will reclaim valuable nutrient and mineral resources for other bioprocesses.

4.6 The Catchment Area

4.6.1 Page 61 of the Local Plan sets out NCC’s guidance on catchment areas. The proposed facility is of a specialised nature and it processes difficult to treat specialised liquid waste. It is therefore considered that a large catchment area would be appropriate and justified.

4.6.2 Nevertheless, W4G envisage that 75% of their waste input will come from a catchment area with a 30 mile radius, as indicated on Drawing GPP/W4G/C/14/06. This is broadly in consistency with a sub-regional catchment area and is a realistic size for such a specialised facility.

4.6.3 W4G needs the flexibility of having 25% of its waste inputs delivered from a national catchment area. The guidance provided on page 61 of the local plan states that "national catchment areas are appropriate if the facility is of a specialised nature specifically relating to the waste to managed or the nature of the processes involved; on the basis of its specialised role the facility is one of very few of its type nationally (or in an identified area).”

4.6.4 This 25% would be solely for the research and development part of the facility. Tankers of waste from W4G’s supplier’s site would be taken to the facility, where the optimum pre-treatment and plant design for the client’s site elsewhere would be identified. The Local Plan recognises that it is not appropriate to oppose facilities serving wider catchments when other industries and commercial enterprises are not so constrained. However, in the interests of wider sustainability the Plan states that Northamptonshire should not take on the role of key sub-national location for waste management. Allowing W4G a 25% leniency per annum would not make Northamptonshire a key sub-national location for waste management.

4.7 Compliance with Energy Policy

4.7.1 Policy 13 requires development to maximise previously developed land and maximise the re-use of energy and heat. The proposed development is in accordance with this policy. The production of renewable energy is in accordance with the NPPF.

4.7.2 The use of difficult to treat waste to produce a renewable fuel means that the facility will make a significant contribution to the targets for the production of renewable energy. Also, it is fully compliant with the emerging National Waste Strategy, which seeks to get the most energy out of waste.

4.7.3 Government policy as set out in DEFRA’s Energy from Waste encourages local planning authorities when considering renewable energy from waste projects to allow waste from other council areas and to allow a location that will provide efficiency and flexibility.

4.7.4 The project has the potential to generate renewable electricity. The NPPF provides that renewable and low carbon energy facilities should be located in suitable areas. The justification for the site location is provided in Section 4.2.
4.8 The Sustainability Credentials Associated with the Development

4.8.1 The NPPF provides that the purpose of the planning system is to contribute towards the achievement of sustainable development. There are three dimensions to sustainable development: social, economic and environmental. The proposed development contributes to all three of these strands, as summarised in Appendix 4.

4.8.2 At the core of the Government’s waste strategy is the objective of moving waste up the hierarchy. The National Planning Policy for Waste (October 2014) builds upon the waste hierarchy and aims to create a ‘zero waste economy’ where the amount of waste being sent to landfill is reduced through reuse, recycling or energy from waste facilities and material resources are only disposed of as a last resort.

4.8.3 Not only is maximising landfill diversion the main thrust of national policy, there is also a legal obligation on waste planning authorities to maximise landfill diversion through the Waste Framework Directive and the Waste (England and Wales) Regulations 2011 (which transpose this into UK law) which contains a clear obligation to apply the waste hierarchy as a priority order.

4.8.4 The proposal will process up to 40,000 tonnes of feedstock per annum, which may otherwise be sent to landfill or cause problems in the sewerage system. The feedstock will be used in a sustainable way to generate renewable energy and gas. The proposals contribute to meeting the Government’s commitment to maximising landfill diversion and creating renewable energy is considered to be a matter that should be afforded significant weight in the planning balance.

4.9 Environmental Considerations

4.9.1 To demonstrate compliance with NCC’s policies, the following environmental impacts are addressed:

- Odour
- Noise
- Traffic and Transportation
- Air Emissions
- Flood Risk Assessment and Drainage
- Landscape and Visual Amenity
- Pest Infestations
- Ecology
- Fire Risk
- Dust and Mud
- Litter
- Cumulative Impact

**Odour**

4.9.2 Policy 22 of NCC’s Minerals and Waste Local Plan (2014) requires that local and environmental amenity is protected. An Odour Management Plan has been prepared, which is included in Appendix 5. This includes details on:

- Inventory of Potential Source Materials
- Potential Receptors
- Releases
4.9.3 The area that has the highest potential for odour concentration is the FOG pre-treatment area and biogas line. Carbon scrubbers will be located on key release points. The pre-treatment process will be fully contained within the building, therefore limiting potential for odour release. Sniff testing will be conducted daily around both the perimeter of the site. All sniff testing test records will be kept in the site dairy.

4.9.4 If a complaint is received, the source of the odour will be investigated immediately and steps will be taken to remove the odour. A record will be kept of all complaints, using the complaint form included in Appendix 5.

4.9.5 For the reasons outlined above, it is considered that odour can be adequately controlled so as to not cause an issue. The proposed development is therefore compliant with Policy 22 of NCC’S Minerals and Waste Local Plan (2014).

**Noise**

4.9.6 Policy 22 of NCC’S Minerals and Waste Local Plan (2014) requires that local and environmental amenity is protected. The only piece of plant on site that would be likely to generate significant noise would be the CHP engines. These CHP engines are relatively small, only having a capacity of 150kw and 120kw. The CHP’s would be contained within acoustically insulated shipping containers. All the other plant and equipment produces minimal amounts of noise. The proposed development is therefore compliant with Policy 22 of NCC’S Minerals and Waste Local Plan (2014).

4.9.7 A full noise survey will be carried out one month after the site is fully operational. This will be submitted to the Environment Agency, as part of the compliance with the permit conditions.

**Traffic and Transportation**

4.9.8 Policy 23 of NCC’S Minerals and Waste Local Plan (2014) is concerned with encouraging sustainable transport. Traffic movements associated with importing waste would equate to approximately 10 tankers per day (10 in and 10 out). This amount is considered to be appropriate in this industrial estate location. There will also be 12 movements (6 in and 6 out) associated with staff vehicle movements. Overall, this amount of traffic is considered to be in compliance with Policy 23 of NCC’S Minerals and Waste Local Plan (2014).

**Air Emissions**

4.9.9 Policy 22 of NCC’S Minerals and Waste Local Plan (2014) requires that local and environmental amenity is protected. There will be no emissions to the atmosphere from the generator and flare, other than the carbon dioxide, which is a component of air. There are two very small CHP’s to be located in the yard area. One with a capacity of 150kw and one for a capacity of 120kw. The emissions that these two components will emit will be minimal.

**Flood Risk Assessment and Drainage**

4.9.10 The National Planning Policy Guidance sets out the requirements for the preparation of a Flood Risk Assessment. The site is located in Flood Risk Zone 1 and consequently has a very low risk
of flooding. The Environment Agency states that sites in Flood Risk Zone 1 have less than 1 in 1000 annual probability of river or sea flooding (<0.1%), which is very low. Unit 12b Earlstrees Road is 0.25 hectares in size and therefore does not need a full flood risk assessment. It does, have a full drainage strategy. The yard area will be fully contained within an ACO drainage system, as shown on GPP/W4G/C/14/03. The tank area will be contained within a fully bunded area. There is a significant slope gradient from the west of the site to the warehouse. This will ensure all run off, spillages and rainwater is collected via the drainage system and channelled to the site’s collection tank to be returned to the site’s main collection tank. It will then either be tankered off site or discharged to the sewer system. The drainage strategy is shown on the Site Layout Plan GPP/W4G/C/14/03.

Landscape and Visual Amenity

4.9.11 Policy 22 of NCC’S Minerals and Waste Local Plan (2014) requires that local and environmental amenity is protected. The unit is surrounded by other industrial uses and therefore the value of the landscape is considered to be low. The tallest structure placed in the yard area (reactors), will be 6 metres high, which is the same height as the building. Therefore the reactors will either be screened by the building or seen against the backdrop of the building. This will not be out of keeping with the industrial estate setting. For these reasons, it is considered that Landscape and Visual Amenity will not be harmed, in accordance with Policy 22.

Pest Infestations

4.9.12 The pre-treatment process will be fully contained within the building and all the outside equipment is fully contained, therefore limiting the potential for pest infestations. W4G will appoint a pest control contractor, to provide regular checks of the entire site, including the offices.

Ecology

4.9.13 Policy 22 of NCC’S Minerals and Waste Local Plan (2014) requires that natural resources are protected. The Application Site is comprised of brownfield land that has been hard surfaced. There is no important ecology on site as it is an industrial estate location. The proposed development will therefore not damage any ecology and is in accordance with Policy 22 of NCC’S Minerals and Waste Local Plan (2014).

Fire Risk

4.9.14 Fire risk is low due to it being a largely wet process. Fire extinguishers will be stored on site for use in the event of a fire. These will be stored at all entrances to the building and tested every 2 months to ensure they are fully functional.

Dust and Mud

4.9.15 Policy 22 of NCC’S Minerals and Waste Local Plan (2014) requires that local and environmental amenity is protected. The risk of dust and mud from the facility is low as the facility is largely a wet process.

Litter

4.9.16 The risk of litter is very low, as liquid waste does not generate litter.
Cumulative Impact

4.9.17 The National Planning Policy Framework places emphasis on demonstrating that the cumulative effects of development in respect of some of the environmental impacts is acceptable. The Application Site already benefits from permission for industrial activities. It is considered that none of the above environmental impacts will cause any more harm than a typical industrial activity. None of the features considered in this chapter are close to being objectionable, none in combination could cause objections and there are no unusual features associated with the development. Therefore, there is no cumulative combined impact from the development considered on its own. The conclusion is that there are no unacceptable levels of impact resulting from the addition of the proposed Anaerobic Digestion facility and pre-treatment process.
5 CONCLUSION

5.1.1 In conclusion, this planning statement has demonstrated that the site is deliverable and will meet the capacity gaps identified for specialised advanced treatment facilities in the Local Plan (2014). It has demonstrated that:

- The location of the site is appropriate as it is compliant with Policy 12 and 16 of the Northamptonshire Minerals and Waste Local Plan (2014). There is a good amount of separation between the proposed site allocation and the nearest residential dwelling (420 metres).
- The facility would help meet the capacity gaps identified in the plan for advanced treatment facilities, in compliance with Policy 11. It would not be in competition with other anaerobic and aerobic digestion facilities in the county as it processes a specialised waste input (liquidised wastes, such as fats, oils and greases).
- There is a need for this type of facility in the county as the fats, oils and greases are mostly collected from the sewerage system. If these are not removed, they can lead to blockages. Typically, this type of waste is often sent to landfill as it is difficult to treat and recycle.
- All environmental impacts can be made acceptable.
- There is excellent access to the site via the A6003, A14, A427 and A423.

5.1.2 For the reasons outlined in this planning statement, the proposed development at Unit 12b Earlstrees Road is compliant with the development plan and is environmentally acceptable. Planning permission should therefore be granted without delay.
## APPENDIX 1: Validation Checklist

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<thead>
<tr>
<th>Item</th>
<th>Status</th>
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<td>Archaeology</td>
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<td>Health Impacts</td>
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APPENDIX 2: Waste4Generation Values and Objectives
High Rate Anaerobic Digestion

Waste Treatment Systems

Company Brief
Mission Statement & Business Philosophy

- The operation of sustainable and viable waste treatments
- Recycling or Recovery of Nutrients & Minerals
- Diversion of waste from landfill
- Reduction of waste’s impact on the environment
- To provide a sustainable solution to Fats, Oils & Greases (FOGs) in regards to their disposal, removal & treatment. Converting this currently problematic waste into one of the following valuable products (via our patent pending technology):
  o Concentrated liquid feedstock for anaerobic digestion for utilisation either at a Waste4Generation AD plant or supplied to an alternative AD plant.
  o Feedstock for biodiesel generation
  o Feedstock for nutrient recovery
- The biogas produced from anaerobic digestion can be used for either electrical production & heat generation (via CHP engine), methanol production, biogas injection or production of liquid biomethane fuel.
- The hydrolysis of the FOG produces a potential biomass fuel from the sanitary products separated from the waste. These can be utilised in biomass burners to yield additional renewable heat & electricity.
- The site will allow Waste4Generation to conduct trials and to optimise processes involved in the treatment of a variety of waste streams, determining the most sustainable and efficient methods. This includes, determining if waste can be treated at source, which not only removes transportation issues, but also prevents waste from being sent to landfill and or potentially deteriorating the sewerage system.

Waste4Generation will look to provide a sustainable solution to all difficult-to-treat waste streams. These waste streams are often discharged to the sewer and have no commercial value; they cause significant blockages & deterioration of the sewerage network leading to environmental incidents that incur substantial additional costs in treatment, remediation & repair. Waste4Generation will look to treat this waste so as to harness its potential energy and calorific value and to reclaim valuable nutrient & mineral resources for other bioprocesses.

The key waste streams targeted for the proposed plant include, FOG from the sewerage system or from the sewage treatment works and from the originating FOG producers. This FOG is converted via our pre-treatment process into a valuable product.
The Waste4Generation high-rate anaerobic digestion (AD) plant is designed to treat more complex waste streams, with the proposed system treating waste within 24 hours. The plant produces only a low strength liquid waste in the form of an effluent, that causes no environmental impact. This is a cloudy water which is discharged directly to the sewer (reducing loading on local sewage treatment works). Our system will be designed to incorporate nutrient recovery, recovering in particular, phosphorus.

High–rate AD is the most efficient treatment process for these types of wastes, removing 90% of the waste and producing a high quality biogas with over 80% methane content. The plant itself will have minimal waste storage, with all waste being processed well within 24 hours of its arrival on-site. There will be no gas storage on site, and no co-digestion of different wastes, with individual reactors operating to achieve maximum biogas yield from each waste stream in process.

The high-rate AD process itself is a proven technology. Orchard House Foods in Corby is now managed by Waste4Generation (since March 2014), demonstrating the viability and reliability of a small footprint AD plant with no detrimental environmental impact (such as odour). Our process is carefully controlled through safe and efficient automated operations with closely monitored KPI’s and plant conditions. Our process parameters are continuously monitored and controlled to optimise the system efficiency and to eliminate any potential H2S production. Our two-stage AD process is proven and patent pending along with the pre-treatment process.

The proposed site in Corby will provide a base for the company’s operations, R&D and administration. It will allow W4G to establish new business opportunities and optimise the plant design, through continuous research to develop smaller more modular and more efficient processes, as well as design bespoke client systems. Research into modular tertiary equipment will allow the system to expand the variety of processed output; these could be biogas including methanol production, liquid biomethane fuel, biodiesel production & gas injection. These plants, if widely adopted at the source of the waste production, will significantly reduce operational & maintenance costs for utility companies as well as Industrial manufacturers.

In comparison to other AD plants being operated in the UK and Europe, the W4G system processes solely waste and not feedstock that could be more ethically used in food production. The W4G system operates on a far faster process period, within 24hrs, compared to a typical 28 day process with conventional AD plants. This make it far more controllable and tolerant to fluctuations in feedstock quality and far smaller in footprint. Economically, the W4G is significantly cheaper to build and operate. According to the Department of Energy and Climate Change (DECC), the cost of one mega watt (1MW) of installed capacity with a convention AD plant is £4.4 million, compared to around £1.5million with a W4G system. Currently conventional AD plants, of which there are currently around 106 in the UK are operating at operational performances of around 67% of thier design output and therefore in reality the true cost is nearer £6.5 million per MW.
The W4G pre-treatment process operates in combination with our high-rate AD system or as a stand-alone unit, generating a product suitable for other revenue streams. The unit can readily hydrolysed FOG, especially hard to processes contaminated brown FOG. These can be processed into a valuable feedstock for biodiesel production with the problematic issues associated with brown FOG removed. With regards to sustainable fuel for transport, W4G are also look to produce LMG/Liquid bio methane, which can be used to operate a tanker fleet to collect wastes for the W4G facility.

Waste4Generation has a small-dedicated team, with the experience to deliver effective and sustainable solutions. Through conducting in-house analysis and in-depth feasibility studies on the potential wastes streams, W4G can confidently:

- Optimised processes of different waste streams
- Establish if the waste is suitable/feasible for anaerobic digestion
- Determine the composition of the waste and if it is viable for nutrient/mineral recovery
- Determine if the waste can be pre-treated in order to increase digestibility for anaerobic digestion or be utilised for biodiesel production.

Our in-house laboratory service will not only analyse each waste stream received, but also determine the potential sustainable plant performance. The laboratory will be undertaking analysis for other AD facilities in the area (as well as waste producers). Furthermore W4G are in the process of conducting a joint study with ALS and RUR3 on the degradation of waste streams, to determine the maximum distance that can be transported and allowed time period prior to processing. We are
also looking into conducting a study with the University of Northampton to produce & publish papers on the subject, as well as providing additional in-house training of staff and potential client operatives.

W4G has previously conducted feasibility studies with both Thames Water & Anglian Water on the sustainable treatment of their FOGs, which are currently either co-digested or sent to landfill. Co-digestion of FOG is highly inefficient, in that the inhibitory effect of the long chained acids exceed the potential increase in biogas production. Our pre-treatment process overcomes this inhibitory stage, allowing the full calorific value of the FOG to be realised into biogas. Traditional AD treatment of FOGs also leads to decreased removal rates and reduces biogas quality. The biosolids produced are also detrimentally affected. The plant size required to treat the waste are often exceeding the plant size/loading and possible retention time available at the sewage treatment works.

Through producing feedstock from hydrolysed FOG, W4G reduce/remove the requirement to grow agricultural crops for feedstock and can conduct feasibility studies in order to determine viability of treatment at source, with future regional centres strategically placed to meet treatment demand (where treatment at source infeasible are not practical).

The company vision is to establish regional treatment centres for FOG, which can supplement the on-site facilities, diverting all waste from unsustainable disposal routes. Local industry & contractors will be utilised for the production & fabrication of the reactors & plant equipment. In addition to the positive environmental impact to the region, W4G will recruit and train local operators, engineers, clerical and managerial staff.

High Rate Anaerobic Digestion Vs. Other Renewable Technology

Solar Panels

- High Maintenance
- Loss of production & efficiency
- Have a large area to kWh production output
- Low efficiency
- Weather dependent
- High Cost of installation
- Long payback periods
- Large footprint

Solar Panels DO NOT

- Treat waste
- Reduce waste transportation and disposal to land
- Provide an reliable alternate and versatile renewable energy options
- Protect the environment
- Prevent environmental incidents
- Enable waste producers to generate sustainable energy to power their process.
- Recover nutrients & minerals (finite resources).
- Provide 95% efficiency
- Solve waste and renewable energy problems
- Meet financial viability without subsidies

Mobile Demonstration Unit

Research & Development Key Areas

Feasibility studies will be carried out by either the mobile demonstration plant or at the proposed new site. The demonstration plant is currently away on a long term study for Thames Water.

- Determine the types of wastes that can be treated
- Production of other renewable fuels & green energy (e.g. liquid biomethane)
- Biogas injection
- Fuel cells
- Methanol
- Liquid methane gas
- Biodiesel
- Electrical Production
- Heat Usage
- Nutrient & mineral recovery
- Oil recovery
- Fuel a fleet of renewable powered vehicles
Type of Waste: Feasibility Study on each individual waste streams to determine:

- Type of process
- Series or parallel operation
- Cost of treatment
- Pre-treatment requirements
- Removal rates, efficiency & methane %
- Recoverable commodities
- Viability of waste treatment at source & investigation into other waste within a close proximity to justify a regional treatment centre.

Our pre-treatment process in conjunction with our two-stage system allows W4G to optimise the treatment process for each individual waste stream.

**Fats, Oil and Greases (FOG)**

FOG’s are now one of the main problems utility companies; industry and councils are facing in regard to:

- Removal
- Disposal (Landfill)
- Sewerage corrosion & restrictions leading to environmental incidents
- Inhibition of the AD process when FOG is allowed to pass into the AD system without pre-treatment.
- The full calorific value and energy of the FOG is not realised due to the incomplete breakdown of the tri-glyceride chains, as well as being processed under less than ideal operational conditions where the waste is co-digested with other potentially inhibiting feedstocks as well as other inhibiting factors in the reaction vessel.
- Within the reaction vessel, untreated FOGs can lead to a rise in long chained fatty acids and a decrease in pH from ideal operating conditions.

The Waste4Generation pre-treatment process converts the contaminated FOG into a desirable feedstock for anaerobic digestion. One tonne of FOG can be converted into 3 tonnes of soluble COD as a viable feedstock for anaerobic digestion. The soluble COD produced, can either be utilised for anaerobic digestion, or the pre-treatment process can be halted at the optimum carbon chain length for biodiesel manufacture.

Contaminated FOG from the sewerage system is typically referred to as ‘brown FOG’ and is currently unsuitable for biodiesel production, when untreated due to the high level of contamination. The intensive chemical dosing required for the conversion is not cost effective. As a result FOG is disposed of at considerable cost to unsustainable routes, such as landfill or incineration.

Waste products such as dairy, chemical, oil & FOG wastes are currently being turned away from local treatment facilities, resulting in such waste being transported significant distances to more reliable
and complex disposal plants elsewhere nationally. The time taken and distance travelled have an effect on the condition of the waste on arrival at the location, compounding the complexity and cost of treatment.

W4G will look to process difficult waste having the potential to reclaim other valuable products, e.g. contaminated plastic waste (FOG coated) allows W4G to remove and treat the organic fraction of the waste, and reclaim the plastic component for recycling.

![Image of waste disposal plant](image.jpg)

Typical COD Removal Example

- Industrial effluent based at 7,000 mg/L COD (chemical oxygen demand) @ 200m3/day.
- This corresponds to 1400 kg of COD loading received by the sewage treatment works at a cost to the customer and to the treatment works.
- Following W4G treatment, the effluent discharged would be below 500 mg/L, freeing up more than 1300 kg of capacity to other local industry and/or extend the capacity at the local sewage treatment works.

W4G Technology

- Proven technology
- Exceeding performance of any other AD plants current in operation or being developed. (95+% removal rates & 80+% methane).

W4G will identify customers with problematic waste streams for on-site feasibility studies utilising our demonstration plant. We will also conduct feasibility studies utilising our reactors at the proposed site, where waste is transported the site for an extended period usually (3-6 months), dependent on waste streams to establish:
o Waste feasible for AD
o Pre-treatment requirements
o Performance
o Plant size
o Operator training
o Potential onsite facility including planning, EA, effluent discharge.
o Detailed proposal

Proposed Site-

W4G design and operate a compact efficient design that every new waste producing installation should incorporate in to its process. This will substantially reduce the loading on sewage works thereby protecting the sewer network, through the recovery of natural resources on-site, allowing generation of their own energy in the form of green sustainable energy whilst removing tankering and waste movements.

Where such an individual system is not a viable proposition to smaller manufacturer, W4G plan to operate local, strategically placed collective process plants, such as we propose here in Corby.

W4G are a British based company looking to create local jobs and utilise local resources, including a proposed training centre. We are looking to produce solutions for all aspects of waste, providing optimum treatments.

The site will produce renewable energy, whilst providing a solution to the unsustainable waste problem i.e., reducing waste to landfill, reducing degradation of sewer, preventing environmental incidents as well as removing the need to grow crops as feedstock for anaerobic digestion.

Other renewable technologies do not solve or help to reduce waste issues. High rate AD is less energy intensive and more efficient than both solar and wind technologies its performance not dictated by weather conditions and subject to deterioration in performance and huge repair/replacement costs.

The process provides a solution for green transportation in the form of biodiesel and LMG /Liquid biomethane.

W4G are looking not just to become a UK company, but a global business, with Northampton being the headquarters and technology centre. We plan to work alongside councils, authorities, manufacturing and utility companies, worldwide, providing green electricity, biodiesel, and liquid methane gas, while comprehensively disposing of waste in a sustainable and highly efficient manner.
APPENDIX 3: Process Diagram
# APPENDIX 4: Sustainability Credentials

<table>
<thead>
<tr>
<th>SOCIAl</th>
<th>ECONOMIC</th>
<th>ENVIRONMENTAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Diversion of waste from the sewerage network, therefore unnecessary tax expenditure.</td>
<td>• Diversion of waste from the sewerage network, therefore avoiding blockages and expensive remedial works.</td>
<td>• Diversion of waste from the sewerage network, therefore avoiding blockages.</td>
</tr>
<tr>
<td>• Diversion of waste from landfill.</td>
<td>• Changing a waste into a resource</td>
<td>• Diversion of waste from landfill.</td>
</tr>
<tr>
<td>• Providing additional jobs.</td>
<td>• Providing additional jobs</td>
<td>• The AD facility is more efficient than most of its competitors.</td>
</tr>
<tr>
<td>• The site will also be a research and development facility to test processes for sites elsewhere.</td>
<td>• The site will also be a research and development facility to test processes for sites elsewhere.</td>
<td>• The pre-treatment process will enable difficult to treat waste to be turned into a liquid waste. This may be able to be used in other AD processes.</td>
</tr>
<tr>
<td></td>
<td>• The site will produce renewable energy.</td>
<td>• There will be no adverse environmental impacts.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• The site will produce renewable energy, thus reducing climate change emissions from power stations using coal/gas.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• The process prevents the need to grow cash crops as feedstock</td>
</tr>
</tbody>
</table>
APPENDIX 5: Odour Management Plan
Earlstree Road Odour Management Plan 15-11-2014

Section 1: Introduction

An odour management plan is required for the Waste4Generation high rate anaerobic digestion research facility based at 12B Earlstree Road, Corby. The proposed AD plant has an estimated capacity of 40,000 tonnes of liquid wastes per year. A proportion of the wastes received by the site will be Fats, Oils & Greases to be hydrolysed to a liquid feedstock. Due to the nature of the wastes, and the direct reception of the waste, the potential release of odour is minimal.

Objectives

The proposed site is considered to be a low odour hazard which utilises enclosed high-rate anaerobic digestion vessels to treat liquid wastes situated at the rear yard of the property. In addition to the high-rate digestion vessels, a patent pending Pre-treatment plant is to be established within the property to receive both liquid and solid fats, oils & greases (FOG), which are destined for landfill and hydrolyse them for further feedstock.

The high-rate anaerobic digestion plant can only treat liquid wastes, which therefore removes the requirement of solid waste reception and depackaging which are both potential odourous activities. The liquid waste is received directly into the 70m³ bunded reception tank via a tanker coupling. The FOG is to be received within the building, enclosed within the pre-treatment reception centre which is subject to odour scrubbing & extraction. The odour management plan for this site has been prepared with in accordance with EA H4 guidance.

The key objectives of this odour management plan is to monitor and manage the site’s operations and undertake appropriate methods to:

- Control & Minimise Odour
- Protect against accidental release or nuisance
- Prevent any unacceptable odour pollution at all times.
- Reduce the risk of odour releasing incidents or accidents, through accordingly anticipation of potential scenarios and planning.
Section 2: Inventory of Potential Source Materials

1. Liquid Waste Feedstock

<table>
<thead>
<tr>
<th>Source Description:</th>
<th>Liquid Waste Feedstock</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Odourous Materials:</strong></td>
<td>Liquid waste between 0 – 100m$^3$ to be received daily and pumped directly into enclosed reception tank.</td>
</tr>
<tr>
<td><strong>Containment / Release point:</strong></td>
<td>Received into sealed enclosed reception tank (70m$^3$ double bunded tank). From this tank, it is pumped forward into feed tanks prior to the anaerobic digestion system.</td>
</tr>
<tr>
<td><strong>Odour Description:</strong></td>
<td>Dependent on feedstock material</td>
</tr>
<tr>
<td><strong>Intensity at point of release:</strong></td>
<td>Varies between the ranges of 0-1. The intensity is taken from VDA 3882 Part 1. Potential odour release is intermittent and very low in potential intensity.</td>
</tr>
<tr>
<td><strong>Pattern of Release:</strong></td>
<td>No expected release with normal plant operation. Direct containment &amp; receiving of the waste. There is an immediate wash down of hoses and reception area following coupling / decoupling of tankers. Waste is processed through the plant within 24 hours, residence time within reception tanks would be no more than 6 hours.</td>
</tr>
</tbody>
</table>

2. Liquid Fats, Oils & Greases

<table>
<thead>
<tr>
<th>Source Description:</th>
<th>Liquid Fats, Oils &amp; Greases</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Odourous Materials:</strong></td>
<td>Liquid fats, oils &amp; greases received via tanker into pre-treatment reception tank.</td>
</tr>
<tr>
<td><strong>Containment / Release point:</strong></td>
<td>Pumped directly into reception tank via tanker coupling.</td>
</tr>
<tr>
<td><strong>Odour Description:</strong></td>
<td>Dependant on source. Fats, oils &amp; grease from Industry, Sewage Treatment &amp; Food Production.</td>
</tr>
<tr>
<td><strong>Intensity at point of</strong></td>
<td>Varies between the ranges of 0-1. The intensity is taken from</td>
</tr>
</tbody>
</table>
**release:** VDA 3882 Part 1. Potential odour release is intermittent and very low in potential intensity.

**Pattern of Release:**

No expected release with normal plant operation. Direct containment & receiving of the waste. There is an immediate wash down of hoses and reception area following coupling / decoupling of tankers.

Waste is processed through the plant within 24 hours, residence time within reception tanks would be no more than 6 hours.

---

### 3. Treated Effluent

<table>
<thead>
<tr>
<th>Source Description:</th>
<th>Treated Effluent</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Odourous Materials:</strong></td>
<td>Treated effluent, low in both suspended solids &amp; Chemical Oxygen demand, discharged directly to sewer. Effluent treated with sodium hypochlorite to remove any residual sulphide dioxide.</td>
</tr>
<tr>
<td><strong>Containment / Release point:</strong></td>
<td>Pumped &amp; discharged directly into the sewer system</td>
</tr>
<tr>
<td><strong>Odour Description:</strong></td>
<td>Treated effluent, inoffensive</td>
</tr>
<tr>
<td><strong>Intensity at point of release:</strong></td>
<td>Varies between the ranges of 0-1. The intensity is taken from VDA 3882 Part 1. Potential odour release is intermittent and very low in potential intensity.</td>
</tr>
<tr>
<td><strong>Pattern of Release:</strong></td>
<td>Continuously discharged to sewer, through sealed pipes.</td>
</tr>
</tbody>
</table>
Section 3: Potential Receptors

The site itself is located within a well-established industrial estate where there are existing waste management and anaerobic digestion facilities. The properties on either side of the proposed site are both plastics & polymer processing industries. The closest residential property is situated more than 420 metres to the west.

The area itself is within close proximity to an existing AD plant (managed by Waste4Generation since March 2014) where there is negligible odour. The new plant will be operated under similar parameters.

Due to the low level of intensity of potential odour, it is considered highly unlikely that odours would ever be detected by the general public especially with the low concentrations of potential release.
Section 4: Releases

The assessment of odour releases is shown below:

<table>
<thead>
<tr>
<th>Odour Release Risk Assessment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hazard</td>
</tr>
<tr>
<td>Receptor</td>
</tr>
<tr>
<td>Pathway</td>
</tr>
<tr>
<td>Risk Management</td>
</tr>
<tr>
<td>Probability of Exposure</td>
</tr>
<tr>
<td>Consequence of Exposure</td>
</tr>
<tr>
<td>Overall Risk</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Odour Release Risk Assessment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hazard</td>
</tr>
<tr>
<td>Receptor</td>
</tr>
<tr>
<td>Pathway</td>
</tr>
<tr>
<td>Risk Management</td>
</tr>
</tbody>
</table>
### Odour Release Risk Assessment

<table>
<thead>
<tr>
<th>Hazard</th>
<th>Delivery of Liquid Fats, Oils &amp; Greases</th>
</tr>
</thead>
<tbody>
<tr>
<td>Receptor</td>
<td>Creation of odour at receptors</td>
</tr>
<tr>
<td>Pathway</td>
<td>Via Air</td>
</tr>
<tr>
<td>Risk Management</td>
<td>Liquid fats, oils &amp; greases received directly into Fat, Oils &amp; Greases enclosed reception tank in enclosed reception area. Procedures for strictly controlling the receiving of the waste. Odour extraction and scrubbing where applicable. Wash down of the reception areas following unloading. Wash down water collected at waste collection pumping station and returned to reception tank. The FOG reception area is closed except for when deliveries are being received (Doors close behind receiving vehicle).</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Probability of Exposure</th>
<th>Low</th>
</tr>
</thead>
<tbody>
<tr>
<td>Consequence of Exposure</td>
<td>Odour Annoyance</td>
</tr>
<tr>
<td>Overall Risk</td>
<td>Low</td>
</tr>
</tbody>
</table>
### Risk Management

Low risk of mud / dusk contamination of vehicles entering the site. All vehicles stopped at gate prior to entering plant for discharge. Heavily contaminated vehicles will be turned away from site or washed down prior to unloading according to reception procedures. Wash down water collected at waste collection pumping station and returned to reception tank.

<table>
<thead>
<tr>
<th>Probability of Exposure</th>
<th>Low</th>
</tr>
</thead>
<tbody>
<tr>
<td>Consequence of Exposure</td>
<td>Odour annoyance</td>
</tr>
<tr>
<td>Overall Risk</td>
<td>Low</td>
</tr>
</tbody>
</table>

### Odour Release Risk Assessment

<table>
<thead>
<tr>
<th>Hazard</th>
<th>Hydrolysis Process for the Treatment of Fats, Oils &amp; Greases</th>
</tr>
</thead>
<tbody>
<tr>
<td>Receptor</td>
<td>Creation of odour at receptors</td>
</tr>
<tr>
<td>Pathway</td>
<td>Via Air</td>
</tr>
<tr>
<td>Risk Management</td>
<td>Fats, oils &amp; greases hydrolysed within an enclosed tank in a separate reception/treatment area. Procedures for treating the waste, with odour scrubbing on top of the tank. Wastes to be treated within 24 hours prior to being pumped forward to the anaerobic digestion plant.</td>
</tr>
<tr>
<td>Probability of Exposure</td>
<td>Low</td>
</tr>
<tr>
<td>Consequence of Exposure</td>
<td>Odour Annoyance</td>
</tr>
<tr>
<td>Overall Risk</td>
<td>Low</td>
</tr>
</tbody>
</table>
### Odour Release Risk Assessment

<table>
<thead>
<tr>
<th>Hazard</th>
<th>Discharge of Treated Effluent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Receptor</td>
<td>Creation of odour at receptors</td>
</tr>
<tr>
<td>Pathway</td>
<td>Via Air / Water</td>
</tr>
<tr>
<td><strong>Risk Management</strong></td>
<td>Treated effluent is pumped directly to sewer. Any remaining odour is treated with sodium hypochlorite prior to discharge. Pipework connected so that effluent connects directly with sewer system with pipework regularly checked for leaks.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Probability of Exposure</th>
<th>Low</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Consequence of Exposure</strong></td>
<td>Odour Annoyance</td>
</tr>
<tr>
<td><strong>Overall Risk</strong></td>
<td>Low</td>
</tr>
</tbody>
</table>

---

<table>
<thead>
<tr>
<th>Hazard</th>
<th>High Rate Two Stage Anaerobic Digestion</th>
</tr>
</thead>
<tbody>
<tr>
<td>Receptor</td>
<td>Creation of odour at receptors</td>
</tr>
<tr>
<td>Pathway</td>
<td>Via Air</td>
</tr>
<tr>
<td><strong>Risk Management</strong></td>
<td>The high rate anaerobic digestion process is fully enclosed to maintain anaerobic conditions. On leaving the reactors, the biogas is passed directly through activated carbon scrubber removing sources of odour (such as H2S). Closely controlled process parameters have been designed and optimised to minimise the production of H2S. The biogas produced is to be utilised either through a biogas CHP engine, for methanol production or for liquid methane gas (renewable fuel for company fleet). The process is fitted with both pressure release valves on the reactors which are a fail-safe of the reactors (and can be fitted with carbon scrubbers). There is also a flare installed on the plant should the engine or other biogas processes not be utilised. Flaring of biogas is only to be utilised as a</td>
</tr>
</tbody>
</table>

---

8
back-up, and the gas flared would have already undergone carbon scrubbing, minimising any potential odour.

<table>
<thead>
<tr>
<th>Probability of Exposure</th>
<th>Low</th>
</tr>
</thead>
<tbody>
<tr>
<td>Consequence of Exposure</td>
<td>Odour Annoyance</td>
</tr>
<tr>
<td>Overall Risk</td>
<td>Low</td>
</tr>
</tbody>
</table>

**Section 5: Primary Control Methods**

*Containment & Treatment*

The majority of potential odour releases on site can be contained and treated through the use of extraction and odour scrubbers/ carbon filters. Each potential point of release either has chemical treatment in the form of carbon scrubbers or sodium hypochlorite additions or is controlled through process parameters and procedures in order to minimise potential odour release.

Carbon scrubbers are situated on key release points including the main biogas line and the FOG pre-treatment plant. These are areas which may have the highest potential odour concentration, and therefore the best available techniques will be utilised to remove potential odours. There will be monitoring of biogas quality both pre- and post- carbon scrubbers to check efficiency of removal and the activated carbon media will be changed regularly to maintain optimum odour removal.

A diligent and effectively controlled routine of discharging the liquid waste into the reception tanks has been determined and will be monitored by operators throughout waste reception. This also allows for any remediation or cleaning requirements to take place immediately after the disconnection of the tanker coupling.

*Treatment of Wastes & Feedstock Utilised*

As the site deals primarily with liquid waste this minimises odour release associated with storing wastes as these are received directly into sealed tanks. The high-rate nature of our process also minimises development of any odours as the waste is processed within 24 hours. Due to the modular nature of the plant, each waste stream is fed individually to a reactor, ensuring there is no co-digestion of wastes which may cause odours issues.
Should an incoming waste not meet desired input criteria, this load will be rejected. In addition to this, contaminated vehicles will not be admitted to site for unloading, and will be turned away. Highly odourous loads, as determined through sniff tests conducted by operators shall be turned away. As vehicles enter our site via highway, they would have to adhere to a minimum standard for approved road haulage. Out of spec vehicles will be reported.

Site Hygiene & Management

The site shall be thoroughly cleaned & washed down on a regularly basis including daily wash downs of all waste reception areas. All cleaning regimes are both documented by procedures and to be included within the site diary and signed off. Any spillages outside of this daily cleaning regime will be washed down immediately.

Section 6

Monitoring & Reporting

Sniff testing will be conducted daily around both the perimeter of the site. All sniff test records will be kept in the site diary.

Sniff testing will be carried out by the site operators. Whilst the operators are likely to be more tolerant to the site odours, independent testing is not considered necessary on a regular basis because of the low odour levels expected.

Section 7

Complaints History

Any complaints received will be logged into the site diary and a complaint form completed and filed.

On receipt of any odour complaints, a set of precautionary measures will take place immediately:

- Inspection of the carbon filters & odour scrubbers on site
- Analysis of removal efficiency of the scrubbers
- Minimise deliveries
- Any particularly odourous feedstock will be removed from site
- Gas line will be checked for leaks
- Chemical correction will be checked for removal efficiency
- Checks for leaks on all sealed tanks & enclosed vessels
The complaint form will be completed within 24 hours of receipt. A log of complaints will be discussed both at the weekly operations meeting and monthly management meeting with all actions recorded in minutes.

The complainant will be contacted and informed of any actions resulting from the complaints as well as the undertaking of the above precautionary measures. A further courtesy call and additional monitoring will be implemented to ensure that odours at the receptor are no longer annoying.

The district council will be informed of any complaints within 24 hours or the next working day (should the complaint take place over a weekend).

Section 8

Contingency Plans

In the event of any substantial equipment failure on site / maintenance requirement, the site will cease to import waste. With only minimal amounts of waste stored on site, this can either be processed through the existing system (depending on equipment involved) or should this not be possible, stored liquid be tankered away from site.

The plant is modular in design so that maintenance can be undertaken on individual pieces of equipment without a full plant shut down. The reactors can also be operated individually so that waste can be treated without all of the reactors online. Key pieces of equipment will have a duty standby kept on site. Specialist equipment is to be kept on maintenance contracts with suppliers.

In the event of power failure on site, all materials on site will be safely contained. The reactors can be safely left dormant should power fail and potential odour still efficiently treated.
# Waste4Generation Earlstree Road Odour Complaint Form

Waste4Generation Ltd  
12B Earlstree Road, Earlstree Industrial Estate  
Corby  
NN17 4AZ

<table>
<thead>
<tr>
<th>Time of Incident:</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Date of Incident:</td>
<td></td>
</tr>
<tr>
<td>Name &amp; Address of Complainant:</td>
<td></td>
</tr>
<tr>
<td>Telephone Number of Complainant:</td>
<td></td>
</tr>
</tbody>
</table>

## Details of Odour Incident

<table>
<thead>
<tr>
<th>Date of Odour Incident</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Time of Odour Incident</td>
<td></td>
</tr>
<tr>
<td>Location of the odour</td>
<td></td>
</tr>
<tr>
<td>(if not at the above address)</td>
<td></td>
</tr>
<tr>
<td>Weather Conditions (i.e Snow, Dry, Rain, Fog)</td>
<td></td>
</tr>
<tr>
<td>Temperature (warm, mild, cold or degrees if possible)</td>
<td></td>
</tr>
<tr>
<td>Wind Strength (Strong, Steady, Light, None, Gales)</td>
<td></td>
</tr>
<tr>
<td>Wind Direction (i.e from the South):</td>
<td></td>
</tr>
</tbody>
</table>
## Complainant’s Description of Odour Incident

<table>
<thead>
<tr>
<th>Question</th>
<th>Answer</th>
</tr>
</thead>
<tbody>
<tr>
<td>What does it smell like?</td>
<td></td>
</tr>
<tr>
<td>Intensity of the Odour (see below)</td>
<td></td>
</tr>
<tr>
<td>Duration (Time)</td>
<td></td>
</tr>
<tr>
<td>Constant or Intermittant in this period</td>
<td></td>
</tr>
<tr>
<td>Other comments regarding the odour:</td>
<td></td>
</tr>
</tbody>
</table>

## Other Information Relating to Odour Complaint

<table>
<thead>
<tr>
<th>Question</th>
<th>Answer</th>
</tr>
</thead>
<tbody>
<tr>
<td>Are there any other complaints in relation to the location previously?</td>
<td></td>
</tr>
<tr>
<td>Are there any other complaints in relation to this incident?</td>
<td></td>
</tr>
<tr>
<td>Any other relevant information?</td>
<td></td>
</tr>
<tr>
<td>Do you accept that the odour likely to be from Waste4Generation activities?</td>
<td></td>
</tr>
<tr>
<td>What was happening on site at the time when the odour occurred?</td>
<td></td>
</tr>
<tr>
<td>Operating conditions when Odour Occurred (Feed/ Waste/ Flow / Type / Flaring / CHP etc)</td>
<td></td>
</tr>
</tbody>
</table>
### Actions to be Taken

<table>
<thead>
<tr>
<th>Actions Taken:</th>
<th></th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Actions to be completed by:</th>
<th></th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Actions Due By (Date):</th>
<th></th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Actions Signed Off:</th>
<th></th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Odour Report Logged:</th>
<th></th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Form Completed By:</th>
<th></th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Date Signed:</th>
<th></th>
</tr>
</thead>
</table>

### Odour Intensity

<table>
<thead>
<tr>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
</tr>
</thead>
<tbody>
<tr>
<td>No Odour</td>
<td>Very Faint Odour</td>
<td>Faint Odour</td>
<td>Distinct Odour</td>
<td>Very Strong Odour</td>
<td>Extremely Strong Odour</td>
</tr>
</tbody>
</table>