



ENVIRONMENTAL MANAGEMENT SYSTEM FOR A BESPOKE ANAEROBIC DIGESTION &
FEEDSTOCK OPERATION
V11.0, April 2023

12B EARLSTREES ROAD, CORBY

WASTE4GENERATION LIMITED

Date	Version No.		Author
2015-2018	Versions 1-9	Prepared by	G. Pawson & S. Randall
2023	Updated Version 10	Prepared by	S. Randall
	Final	Approved by	Stewart Manning

Table of revisions:

Version	Changes made	Date	New version
-	Implementation of new document produced by GPP Planning Ltd	01/04/2015	1
1	Changes to Waste Code list in Appendix 4	9/07/2015	2
2	Addition of 2 waste codes from the Standard Rules Permit list	12/08/2015	3
3	Amendment of Novel Waste Streams in compliance with Confidentiality	19/08/2015	4
4	Amended for Schedule 5 Notice, EWC codes, Contingency	08/10/2015	5
5	Addition of Pre-conditions & requirements	05/12/2015	6
6	Amendment of Procedures & site drainage	10/01/2016	7
7	Addition of Permit Variation Codes	07/12/2016	8
8	Revision for amended FOG EWC Codes	30/10/2017	9
9	Leachate & Anti-freeze Variation. Addition of Aerobic Process	26/10/2018	10
10	Upgrade to Installation – Amendment of Facility Operations	23/03/2023	11

CONTENTS

INTRODUCTION

1 THE SITE	6
2 MANAGEMENT	9
1.1 General Management.....	9
<i>Table 5: Site's Permit History</i>	9
2.2 Accidents that may cause pollution	10
2.3 Site Security	11
2.4 Site Engineering, Maintenance & Infrastructure	11
2.5 Training.....	13
2.6 Complaints	13
2.7 Site Condition Report	13
2.8 Other requirements for compliance	14
3 OPERATIONS	16
3.1 Activities.....	16
3.2 Operating techniques	16
3.3 Analysis to monitor operations.	16
<i>Table 9 Acceptance Analysis Carried out on Potential Waste Streams Arriving at Site</i>	17
3.4 High-Rate Anaerobic Digestion (AD).....	20
3.5 Feedstock Preparation	21
3.6 Pre-Operational Conditions.....	21
3.7 Waste Acceptance	21
3.8 Hazardous Waste Treatment	22
3.9 Site Drainage.....	23
3.10 Decommissioning & Permit Surrender	23
4 EMISSIONS AND MONITORING	24
4.1 Emissions to Water, Air or Land	24
4.2 Emissions to Groundwater	24
4.3 Control of Emissions to Land and Water.....	24
4.4 Pests	25
4.5 Odour	25
4.6 Bioaerosols.....	26
4.7 Noise and vibration	26
4.8 Monitoring.....	27
5 INFORMATION	28
5.1 Records	28
5.2 Reporting	28
5.3 Notifications	29
6 Associated Documents & Drawings	30

6.1	Drawing 1: Site Layout.....	30
6.2	Drawing 2: Receptor Plan.....	31
6.3	Drawing 3: Drainage Plan.....	33
6.4	Drawing 4: Emission Point Sources	34

Appendices & Drawings

<u>Table of Included Plans</u>		
<i>Drawing No.</i>	<i>Drawing Title</i>	<i>Page No.</i>
1	Site Layout	32
2	Receptor Plan	33
3	Drainage Plan	34
4	Point of Emission Plan	35

INTRODUCTION

The Waste 4 Generation (W4G) Ltd. treatment and recovery facility is on Earlstrees Industrial Estate, 12B Earlstrees Road, Corby NN17 to the north edge of Corby. W4G Corby has a unique R&D based focus, which looks to bring knowledge, experience & innovation to site operations. The site comprises of a number of elements, as it has evolved along with the requirements of the anaerobic digestion (AD) industry. Initially the site was based solely on high-rate AD of various waste streams, typically targeting the more difficult and complex and aiming to divert them from landfill.

Following W4G's extensive work with large scale AD plants, it was found that there is significant demand for the high-quality AD feedstock. Unfortunately, with such demand across the country, AD plants are shipping low quality feedstock, with low dry matter and poor nutrient quality, over excessive road miles. W4G, alongside the AD plant, are able to process and refine existing waste streams, providing a central hub for producing high quality feedstock and reducing the road miles of essentially "water" across the UK. With knowledge and experience, W4G expertly blend wastes and products to produce a feedstock blend which can be individually tailored to the destination AD plant. Unlike where plants simply take in wastes to try and hit volumetric and calorific capacities, the W4G approach is more holistic, and aims to balance out solids, proteins, sugars as well as trace nutrient addition. This helps the destination AD plants to overcome and prevent issues such as overloading and foaming, and other triggers of digester failure. The screening and blending of wastes onsite, means that the low-quality source segregated wastes/effluents can be processed via our high-rate AD plant (whether in series or in parallel), instead of incurring more road miles, and used to produce renewable energy. This in turn reduces digestate removal requirements, provides improved removal rates & reduces the presence of inhibitors and the probability of foaming.

The AD facility has the ability to treat specialised food waste, such as fats, oils and greases (FOG's) as well as novel wastes diverted from landfill, including organic polymers & adhesives and FOGs from sewage treatment. Through anaerobic digestion, the feedstocks produce biogas and clean treated liquid effluent, providing both waste treatment and waste recovery. Where suitable, these wastes can be recovered for feedstock for designated partner AD plants. The gas will be utilised by an onsite CHP engine in order to produce renewable heat and electricity. This will be fed into the local distribution network, or be provided directly to nearby industries as well as used to heat the processes on site, including the pre-treatment process as well as the warehouse & offices. The site is designed to meet future demands for feedstock production as well as allowing for progress in various areas of research & development.

W4G provides a sustainable solution to many difficult-to-treat waste streams, such as FOGs as well as hazardous wastes. 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 are dedicated to remove the strain on the struggling sewerage system throughout the UK, assisting in the reduction of sewerage entering water courses.

In addition, W4G have developed pre-treatment processes to facilitate and treat organic polymers diverting the waste from landfill. The W4G pre-treatment process also facilitates the treatment of sewer FOGs throughout the sewer network and from the sewage treatment works. This waste is also typically disposed of to land, and W4G have developed a specific sustainable treatment method to address this issue. To provide a previously untapped waste stream which is highly desirable for anaerobic digestion and proven to achieve high gas yield & quality in the on-site digesters.

Other sustainable solutions which have been developed on site include the treatment of non-hazardous anti-freeze liquid, where a two stage AD process efficiently breaks down the glycol alcohols to give high quality biogas. Numerous trials have been completed on this successfully to provide exceedingly high biogas quality, with the discharge effluent compliant with the site trade effluent discharge consent. Due to the unique site layout, all processes can be segregated or combined depending on feedstock, treatment process & destination, ensuring that only waste designed to be blended are then mixed. This is controlled through a number of designated tanks and quality controls put in place.

Another non-standard waste stream, which we have developed a specific treatment method for is for non-hazardous landfill leachates. Often these waste streams are treated via anaerobic digestion at municipal treatment plants with

sufficient treatment capacity to dilute the potentially toxic elements however this is an inefficient treatment method without maximising the conversion to biogas. Through our R&D centre, we can remove the majority of the metals as well as treat components such as sulphides, to neutralise them ahead of our AD system. The anaerobic bacteria, particularly in two stages, can then convert the remaining organics and chemical oxygen demand into biogas. With the unique layout of site, this entire process can be segregated from the other site operations. Once again, this reduces the load on to the receiving sewage treatment works, which are already overloaded, allowing us to utilise and implement our cutting-edge technology.

W4G design bespoke feedstocks to meet the requirements of partner sites. Each waste stream / product is tested on reception and is assigned to a specific reception tank. These can then be transferred to the blending tanks to create a balanced feedstock.

Table 1 Typical inputs to the high-rate AD plant on site

Typical Inputs for High-Rate AD Plant			
Distillery Wastes	Liquid Food Wastes	Liquid Sauces	Glycerine / Glycerol
Brewery Wastes	Pharmaceutical Wastes (Non-hazardous) e.g. shaving foam	Adhesives & Polymers (e.g. Synthomer)	Non-hazardous Anti-freezes
Sewer FOGs	Yeasts & Hops	Bakery Wastes	Biodiesel waste
Milk, Dairy Wastes & Whey	Fat Trap Wastes	Blood Washings	Leachates

Table 2 Typical waste inputs to feedstock materials to be exported to partner AD sites

Typical Inputs for Feedstock Production for Off-site Generation			
Distillery & Brewery Wastes	Liquid Food Wastes	Vegetables & Veg Processing	Fruit Wastes & Solids
Grains	DAF Sludges	Potato Products	Glycerine / Glycerol
FOGs	Yeasts & Hops	Bakery Wastes	Biodiesel waste
Milk, Dairy Wastes & Whey	Chicken Litter	Concentrated Syrups	Poultry Wastes

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. The treatment processes for the weaker effluent and the more concentrated solids fractions are categorised as recovery from waste instead of simply waste treatment, improving sustainability and progress within the waste hierarchy.

In the last year, we have further expanded into the investigation and determination of the effects (and potential benefits) of utilising nano bubble (including ozone) technology as a tertiary or even quaternary form of effluent treatment, with the facility to deliver consent compliance with even the most complicated of waste streams. The R&D facility provides a research base for potential applications throughout the UK in a bid to improve water quality and sustainability, including farming, agriculture, water, and waste treatment as well as industrial applications.

1 THE SITE

- 1.1.1 The Waste 4 Generation (W4G) Ltd. treatment and recovery facility is on Elstree Industrial Estate, 12B, Earlstrees Road, Corby NN17 to the north edge of Corby.
- 1.1.2 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 are a number of office buildings which are closer, which are highlighted in both the Odour Management Plan and Environmental Risk Assessment, as are the residential properties. There is good access to the strategic highway network via the A6003, A14, A427 and A423.
- 1.1.3 The waste storage and treatment activities will be contained to the permit boundary as shown on the Site Layout Plan Drawing (Drawing 1).
- 1.1.4 The proposed increase to site capacity is from up to 35,000 tonnes per annum to up to 109,500 tonnes per annum imported waste, with an average daily volume of up to 300 tonnes a day both in and out (in order to maximise return loads and minimise tanker movements). The tanks below are subjected to a primary & secondary containment assessment and meet the Environment Agency's bunding requirements. This also aligns with Anglian Water trade effluent consent limits (capacity of up to 300m³/day).
- 1.1.5 The site consists of the following main infrastructure:
- 1 No 150 kW CHP Engine
 - 1 x 100 NM³/Hour Biogas Flare
 - 1 x 10 NM³/Hour Biogas Flare
 - 1 No. Boiler & Fuel Storage Tank
 - Reception building containing R&D facility and feedstock & product storage tanks
 - Odour abatement system
 - 4 No. Digesters (reactors)
 - 1 x 60m³ Nano Bubble / Flash Aeration Tank
 - 1 x 60m³ Feedstock Storage Tank (R6)
 - 1 x 75 m³ Reception Tank (RT2)
 - 1 x 30m³ Reception Tank (RT1)
 - 2 x Batch Feed Tanks 50m³ each (ABP & MBT)
 - 2 x DAF units (Pre & Post High-Rate AD Plant) with associated break tanks / sludge storage tanks
 - System of Polishing Tanks & Final Effluent Discharge
 - White, Grey & Gold Feedstock Blending Tanks
 - 1 x 50m³ Solids Bay

1.1.6 Table 3 below lists tank capacity on site as well as the capacity following installation upgrades:

Table 3 Site infrastructure

Site Capacity					
No	Item	Capacity m ³	No	Item	Capacity m ³
1	Reception Tank 1	30	2	Reception Tank 2	70
3	Reactor 1	60	4	Reactor 2	60
5	Reactor 3	60	6	Reactor 4	60
7	Reactor 5	60	8	Reactor 6	60
9	Main Break Tank	10	10	ABP Storage Tank	50
11	Main Balance Tank	50	12	Silver Product Tank	20
13	DAF	5	14	DAF Sludge Tank	8
15	DAF Break Tank	3	16	80°C Hot Water Tank	2
17	50°C Hot Water Tank	2	18	Kerosene Tank	2
19	Final Effluent DAF	10	20	Final Effluent DAF Break Tank	3
21	Rotary Screen Break Tank	2	22	Rotary Screen Overflow	1
23	Polishing Tank A	10	24	Polishing Tank B	7
25	Polishing Tank C	7	26	FE/Nano Bubble Ozone Polish Tank	10
27	Methane Scrubber	1	28	Drum Screen Pumping Station	5
29	Onsite Pumping Station	1	30	Chemical Storage Tank	15
31	FE DAF Sludge Tank	5	32	White Feedstock Tank	40
33	Gold Feedstock Tank	50	34	Silver (Grey) Feedstock Tank	50
35	Caustic IBC	N/A	36 - 38	39 – Also Blank	N/A

Installation Upgrade Capacity					
No	Item	Capacity m ³	No	Item	Capacity m ³
40	Still 5 IBC Storage	45	41	Still 5 Processing	3
42	Caustic IBC (Bunded)	1	43	60°C Hot Water Tank	1
44	Kerosene Tank	1	45	Feedstock Storage Tank	30
46	Feedstock Storage Tank	30	47	Feedstock Storage Tank	30
48	Product Feedstock Tank	30	49	Product Feedstock Tank	30
50	Product Feedstock Tank	30	51	Waste Feedstock Tank	30
52	Waste Feedstock Tank	30	53	Waste Feedstock Tank	30
54	Complex Waste Reception	30	55	Complex Waste Reception	30
56	Nano Bubble Ozone Injection Tank	30	57	Nano Bubble Ozone Injection Tank	30
58	R&D Break Tank	2	59	R&D Break Tank	2
60	R&D DAF Unit	5	61	R&D DAF Break Tank	10
62	Fine Screen Break Tank	2	63	Ceramic Break Tank	2
64	Reverse Osmosis Break Tank	10	65	Solids Bay 1	50

1.1.7 The total installed capacity following installation upgrades will be 1,353 m³. The above details the physical storage capacities of all tanks on site. Surplus to this, there is additional key plant & equipment including the following: 150 kWh CHP engine, Boiler & Heating System, 1 x 100 NM³/hour flare & 1 x 10NM³/hour as well as the associated pumping, pipework, recirculation & transfer system.

1.1.8 The site has been assessed to determine associated sensitivities in regards to the site’s operation. These were initially assessed prior to the site’s construction in 2015, and have been reviewed with the site’s capacity upgrades. The proposed upgrades do not extend or increase the site’s size or expand the existing boundaries (**Ref Phase 1 Study - Soiltechnics**). The application of BAT techniques is required to further reduce potential environmental impacts from the site’s operations. A summary of the following below:

Table 4: Site’s Sensitivity Summary

Site’s Sensitivity Summary	
Geology	Infilled ground. Historic Quarrying in the area. Site fully surfaced. Recovered land.
Hydrogeology	Site fully surfaced. Unproductive strata. Secondary aquifers largely absent in the surrounding area. Site not in a potable water supply area.
Surface Water	Closest surface water connection 270 metres away, connected to the sewerage network. Low overall risk.
Flood Risk	Not situated in a flood risk zone.
Human Receptors	Restricted pathways due to the enclosed nature of the site. No risk of human receptors affected by vegetation. Risk to human receptors assessed within Environmental Risk Assessment, Bioaerosol Risk Assessment, Odour Risk Assessment & Odour Management Plan.
Ecological Receptors	No ecological receptors identified in Study. Site built on existed industrial estate with other waste treatment facilities in the vicinity.
Scheduled Monuments	No scheduled monuments identified in Study. Site built on existed industrial estate with other waste treatment facilities in the vicinity.
Air Quality Management Areas	Site not located in an air quality management area. Site built on existed industrial estate with other waste treatment facilities in the vicinity.

2 MANAGEMENT

1.1 General Management

2.1.1 Waste4Generation Limited (W4G) ‘the Operator’ will only carry out authorised activities specified in schedule 1 table S1:1 of the environment permit (Permit reference: EPR/CB3902XP/V004). Since the original granting of the bespoke environmental permit November 2015, there have been a number of admin variations completed for the site. These variations are summarised below:

Table 5: Site’s Permit History

Permit History	
Permit Granted – November 2015	Initial Bespoke Permit
Variation V002- 2016	Addition of EWC Codes & Amended of Company Address (Food Waste & Molasses EWC Codes added)
Variation V003 – 2017	Addition of EWC Codes
Variation V004 - 2018	Addition of EWC Codes – Addition of 20 03 06 for Anglian Water FOG Trial

2.1.2 Condition 1.1.1 of the environmental permit requires the operator to manage and operate the activities in accordance with a written management system that identifies and minimises the risks of pollution, including those arising from operations, maintenance, accidents, incidents, non-conformances, closures and those drawn to the attention of the operator as a result of complaints and using sufficient competent persons and resources.

2.1.3 The site will be managed and operated utilising sufficient competent personnel and resources.

1.1.1 W4G will operate their own Environmental Management System (EMS) to ensure the environmental permit is complied with. The system follows the Plan – Do – Check – Act cycle. The cycle represents a continual process of review and improvement of performance, however, at least every 4 years or in response to changes in activities, accidents, incidents or non-compliance a complete review of the Management System will be undertaken.

2.1.4 Records demonstrating compliance with the EMS, (including all operational and emergency procedures), and Environmental Permit will be maintained and retained in the site office or the permit holder head office.

2.1.5 All employees will be made aware of and trained in the requirements of the Environmental Permit and EMS.

2.1.6 The site will be managed by a technically competent manager (TCM). The Environment Agency will be kept informed of any changes to the TCM. The TCM holds the relevant WAMITAB qualification and maintains continuing competence every 2 years. In fact W4G has several TCMs available on site to cover periods of holiday and sick leave.

2.1.7 Following the guidance ‘Legal Operators and Competence Requirements’¹, the minimum attendance in the initial stage of a plant’s operation is 20% of the operating hours. Following the initial 6 months, the minimum attendance is determined in agreement with the Environment Agency (EA). If there is a compliance rating score of more than

¹ <https://www.gov.uk/guidance/legal-operator-and-competence-requirements-environmental-permits> Accessed 13 April 2023

16 in any quarter, then there is a requirement to return to the attendance requirements of the first 6 months of operation (20% of operating hours). However regardless of compliance score and how long the plant is operational, the TCM need not attend site more than 48 hours per week.

2.1.8 The site is operating at 12 hours a day, and therefore the minimum attendance for a TCM is 17 hours a week.

Table 6: Site operational hours

Operational Hours Breakdown									
Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday	Total	20%	(Hours)
12	12	12	12	12	12	12	84	16.8	Current
24	24	24	24	24	24	24	168	33.6	Future

2.1.9 The Site Manager is responsible for day to day operations and ensuring compliance with the environmental permit and other relevant legislation (**Reference: Staff Structure Diagram**).

2.1.10 The site shall strive and work towards the requirements of an accredited environmental management system, for example ISO 14001. As the site is being upgraded to an installation, the next step of development is for the site to undertake ISO accreditation once the site upgrades are completed.

2.1.11 The site will undertake appropriate measures to ensure that the progression of the waste hierarchy is maintained. The site’s activities themselves are classified as ‘waste recovery’ and the company actively targets waste streams that can be diverted from landfill. Any wastes generated on site will be disposed of in a manner in keeping with the waste hierarchy. The DAF sludge produced from the site is fed into the feedstock production process which helps generate electricity at W4G partnered AD plants. Any waste disposal from site is undertaken in a manner that minimises its impact on the environment. The rag recovered from the wastewater FOG process is being developed into a biofuel.

2.2 Accidents that may cause pollution

2.2.1 A risk assessment of activities including incidents and accidents, and their potential impact on the environment has been undertaken. The Environmental risk assessment (ERA) will be reviewed every 2 years. (**Reference Environmental Risk Assessment & Accident Management Plan**).

2.2.2 Contingency arrangements are in place to minimise the risks and impacts to the environment in the event of fire, severe weather and breakdown of essential machinery (**Reference Contingency Plan**).

2.2.3 The site’s Contingency Plan details what to do should individual pieces of equipment fail, as well as details how to control the release of biogas from site. There are a number of mechanisms to control the release of biogas should either the flare/s or the CHP be inoperable. The Contingency plan also details the sequence of fail-safes the plant has and the precautions required to be taken by both management and the operatives (**Reference Contingency Plan**). The site has been DSEAR assessed and the DSEAR requirements on plant shut-down / escape of biogas are detailed within the Contingency Plan.

2.2.4 In the event of a power cut, the Contingency plan details the staged shut-down of site, to reduce and then cease biogas production and how site can be operated in a manual safe shutdown. The site in standard operating conditions is controlled by the SCADA system, which would shut-off in the event of an extended power-cut / failure of contingency equipment. The Contingency plan details how to shut down the site’s operations both with & without the SCADA system (**Ref Contingency Plan**).

2.2.5 The site has a standalone Accident management plan (AMP) which references the Fire prevention Plan and fire action plan, all documents are held in the site office. A copy of the Fire Action Plan is held in the site office. The site has undertaken a Fire Risk Assessment and remedial actions have been put in place (**Reference Accident Management Plan, Fire Prevention Plan & Fire Action Plan**).

- 2.2.6 Firefighting equipment will be checked frequently and maintained by the nominated site Fire Wardens. Fire drills will be undertaken at least quarterly. W4G have an external contractor assess, supply and maintain fire extinguishers, ensuring all extinguishers are fit for purpose in location and in good, working condition.
- 2.2.7 All staff will be trained in the Fire Procedure and Fire Wardens will be trained to use the Firefighting equipment.
- 2.2.8 The site has a dedicated spill and drainage procedure in case of incident, of which all staff are trained in. The spill & drainage procedure details how to effectively clean up the spill, mediate any risk and provides details on the bund storage capacities and volumes. In addition to the Spillage & Drainage Procedure, the site also has a Cleaning & Hygiene Procedure which details cleaning requirements and how to maintain site cleanliness (**Ref Site Spillage & Drainage Procedures and Site Hygiene & Cleaning Procedures**).
- 2.2.9 All staff will be trained to use all contingency plans, drills will be undertaken for all contingency plans at least annually. All contingency plans will be reviewed every 2 years or after an 'incident'.
- 2.2.10 In the event of an accident that has the potential to cause pollution, the incident will be recorded in the site diary and an investigation will be conducted to ascertain the cause, where necessary procedures will be reviewed to prevent further accidents.
- 2.2.11 All accidents that occur that have the potential to cause pollution will be notified to the Environment Agency as soon as possible by telephone within 24 hours of the event being identified. A Schedule 5 Notification (attached to the permit) will be completed and sent to the Environment Agency within 24 hours of the event being identified. A copy of the submitted Schedule 6 Notification will be retained in the site office for the life of the permit.
- 2.2.12 Where identified by the Environmental Risk Assessment, an Accident Management Plan will be implemented for the control of operations that may cause pollution (**Reference Environmental Risk Assessment & Accident Management Plan**).

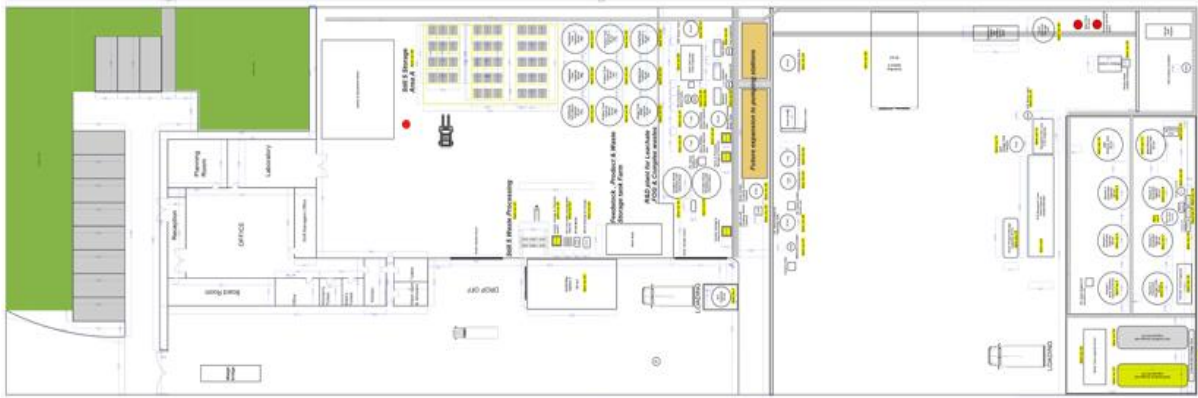
2.3 Site Security

- 2.3.1 The main access to the site is fenced and both sets of gates will be locked when the site is not in operation. Access to the site is through two main gates. Gates are shut following tanker access & egress.
- 2.3.2 All drivers are required to report to reception and sign in prior to their admittance to site.
- 2.3.3 The site identification board is located at the entrance to the site from the main road. This board contains details of who to contact in an emergency and opening times (**Reference Site Identification Board**).
- 2.3.4 The site is monitored by CCTV 24/7 and access to the plant and reception area behind two sets of gates which are only unlocked on tanker arrival.
- 2.3.5 No unauthorised personnel are permitted on site. All personnel are required to sign in, with a site induction for any new attendees, contractors etc. Correct Personal Protective Equipment (PPE) must be worn throughout site in accordance with the Site Rules.
- 2.3.6 The site is floodlit, and there is 24/7 security monitoring including evenings and weekends. The site is also fitted with intruder & fire alarms. There are written fire and intruder response procedures for any alarms (**Reference Fire & Intruder Escalation Plan**).

2.4 Site Engineering, Maintenance & Infrastructure

- 2.4.1 An inventory of all equipment, machinery and vehicles is retained by the Site Manager and is located in the site office. The inventory includes all supplier's contact details and specifications as well as details of alternative equipment suppliers in case of emergency. The key pieces of equipment, infrastructure and installed capacity are

detailed above. The below details the site layout throughout the proposed site capacity expansion, which shows the majority of the site’s upgrades taking place within the warehouse.



- 2.4.2 Daily checks are undertaken and logged in the book relating to each individual item of equipment, machinery and vehicle. Any issues or discrepancies are immediately flagged with Site Manager to be resolved as soon as possible.
- 2.4.3 Equipment and machinery is serviced and maintained in accordance with the manufacturer’s recommendations. The plant is designed to be low maintenance and not personnel intensive. Regular scheduled maintenance is planned throughout each section of the site. All operational staff are made aware of planned maintenance, areas are made safe, and permits to work are issued to all staff and contractors involved. The plant can be shut down and equipment isolated through the SCADA system, and failsafe system and procedures in place to prevent system being switched on whilst maintenance is taking place. A full Health & Safety assessment is undertaken prior to commencement of works. In the assessment of the proposed maintenance, if the risk of potential odour release is highlighted, abatement measures are determined, and procedures put in place to reduce risk of odour release or odour affecting local receptors.
- 2.4.4 Records of daily checks, service and maintenance report forms for the equipment and machinery are kept in the site office. These report forms are kept with all permits to work to ensure that all works have been undertaken according to procedure detailed and signed off by appropriate personnel, typically the site manager or operations manager/ director.
- 2.4.5 All buildings and infrastructure are regularly visually inspected and recorded in the site diary. Any discrepancies or problems are flagged immediately with site management and investigated.
- 2.4.6 A checklist is used to ensure all items of infrastructure and buildings are inspected. These checklists are kept in the site office and retained for 6 years.
- 2.4.7 All repairs to equipment, machinery, buildings and infrastructure are undertaken within 7 days of detection at the latest. Key spares as well as duty standbys for key equipment are kept onsite.
- 2.4.8 Details of repairs are retained in the maintenance logs for each piece of equipment or machinery. Details of repairs to buildings and infrastructure are recorded in the site diary.
- 2.4.9 W4G only utilise approved contractors and are in the process of induction into the Achilles programme, under which all contractors will be subject to similar assessment, ensuring quality in both management and supply of equipment. In the upcoming months, W4G will be working towards ISO 14001 throughout the operation of the plant. All equipment used on site is CE marked and meets required quality standards by suppliers.

2.5 Training

- 2.5.1 All staff employed at the site are fully trained (in-house training) in the use of the machinery, COSHH and chemical handling and the procedures involved in the Management System, including accidents/incidents, complaints, fire and waste acceptance. Additional staff training includes confined space, telehandler and WAMITAB level 4, fire marshal, abrasive wheel & first aid. Additional training courses to be provided where required.
- 2.5.2 All new staff are to receive 'new starter' training within 2 months of commencing employment. Refresher training for all staff will be undertaken at least annually.
- 2.5.3 A copy of training records for each member of staff is maintained by the operator's head office for the length of service of each employee.
- 2.5.4 Following an update to any relevant EMS documents e.g. procedures, all employees are to receive an updated copy for their records, and to sign to confirm that they have read and understood the document and associated appendices.

2.6 Complaints

- 2.6.1 Any complaints made about operations on the site must be recorded by site staff who are made aware of the complaint from any stakeholder including the regulator (verbally, via email, via text, via phone, or via social media) by completing the Complaints Record Form (**Reference Complaints Form & Record**).
- 2.6.2 To gather enough information to enable a proper investigation, all complaints received must provide as a minimum the level of detail required by the Complaints Record Form. All complaints will be responded to by the Site Manager within 5 working days of receipt.
- 2.6.3 Complaints will be investigated by the Site Manager to find a cause of the complaint using information from the site diary, site staff and on-site weather station to determine the cause. The outcome of the investigation and any required actions will be recorded in the Complaints Record Form.
- 2.6.4 Depending on the outcome of the investigation, operational procedures will be updated and staff will receive refresher training on procedures, as necessary.
- 2.6.5 The completed Complaints Record Form will be kept on file and made available to the Environment Agency for inspection as required.
- 2.6.6 Any complaints in regards to potential environmental incidents received by the site directly will be notified to the Environment Agency by using the hotline telephone number or national email address and the notification form in Schedule 5 of the environmental permit. A copy of the sent notification form and any attachments will be retained by head office.

2.7 Site Condition Report

- 2.7.1 A Site Condition Report should provide baseline data of the condition of the site before the permit was issued and before any activities to be permitted had commenced. The Site Condition Report (sections 1-3) was submitted to the Environment Agency as part of the application to vary the existing environmental permit to Industrial Emissions Directive requirements. A specialist contractor carried out a ground investigation survey², in agreement with the planning permission requirements.

² Site Condition Report - Soiltechnics

- 2.7.2 Sections 4, 5, 6 and 7 of the Site Condition Report will be maintained throughout the life of the site with regard to changes of activities and pollution incidents.
- 2.7.3 A copy of the Site Condition Report is held at the operator's head office.
- 2.7.4 In the event the activities on the site cease for a period of greater than 1 month, the Site Manager or company director will inform the Environment Agency as soon as possible by telephone and using the notification form in Schedule 5 of the environmental permit. Whilst there are no expected shutdowns of the plant planned except for scheduled maintenance, both enforced shutdowns and dissolution of the company have been planned for.
- 2.7.5 The Site Manager or a company director will inform the Environment Agency of the recommencement of activities giving at least 5 working days' notice, using the notification form in Schedule 5 of the environmental permit.
- 2.7.6 If W4G cease trading or go into liquidation or receivership, the company director will inform the Environment Agency within 14 days in accordance with permit condition 4.3.4.

2.8 Other requirements for compliance

- 2.8.1 The storage of fuel and oil will be compliant with the requirements of the Oil Storage Regulations.³
- 2.8.2 Hazardous waste shall not be mixed, either with a different category of hazardous waste or with other waste, substances or materials, unless authorised by Schedule 1 S1.1 of permit and appropriate measures taken. These wastes will be entirely segregated from all other processes on site.
- 2.8.3 The site will have separate storage for animal by products, non-hazardous and hazardous wastes, as well as being able to individually quarantine these wastes with each suitably segregated.
- 2.8.4 Quarantine and storage logs shall be maintained.
- 2.8.5 All movements of hazardous waste are tracked & recorded. Movements are to be minimised where possible.
- 2.8.6 As part of our Duty of Care requirements, Transfer and Consignment notes (for any hazardous waste) will be completed for the transfer of waste. Any outgoing waste which may include any non-conforming waste received at the site, screened solids or hydrolysed feedstock for conventional anaerobic digestion plants; a transfer/consignment note will be accompany the waste being moved to an appropriately permitted facility. Hazardous Wastes are subjected to additional treatment parameters, more rigorous pre-acceptance and acceptance & rejection procedures.
- 2.8.7 A copy of the environmental permit for all facilities used for outgoing waste will be requested from the contractor, who will only be used when confirmation has been received the site is authorised to accept the waste. A copy of environmental permits for the alternative disposal routes required in pre-acceptance is required. W4G conduct suitable due diligence on the receiving partnered plants in regard to their capacity, acceptances and requirements prior to sending any feedstock for off-site treatment.
- 2.8.8 The completion of transfer/consignment notes and destination of outgoing waste will be routinely audited to ensure continued compliance and that the best disposal / recovery option is being used and the best gate fees are available.
- 2.8.9 In regards to Hazardous Waste Producer Registration, if over 500kg of hazardous waste is produced by the site in a year the company will be required to register as a hazardous waste producer with the Environment Agency. The company SIC code (38320) must be used to register.

³ <https://www.gov.uk/guidance/storing-oil-at-a-home-or-business>

W4G is a registered Hazardous Waste Producer (Registration No: OPK388, Registration Date: 08-07-15). With a research & development laboratory as well as the use of chemicals on site, the site itself was registered.

3 OPERATIONS

3.1 Activities

- 3.1.1 Activities on the site will include the following provided by the permit variation including additional activities and a change from a waste operation permit to an installation permit. Each of these processes have their own process flows & procedures controlling their performance, outputs & utilisation.

Table 7 Description of activities carried out on site

High-rate anaerobic digestion, utilising 60m ³ digesters to generate biogas
Utilisation of biogas with a CHP engine to provide renewable heat & power
Blending & generation of feedstock for off-site waste recovery / energy generation with partnered AD plants. This includes specifically blending the wastes, improving their calorific value, de-watering, balancing the feedstock composition as well as nutrient addition where required.
Discharge of treated effluent via trade effluent consent
Aerobic treatment utilising ozone / nano bubbles for tertiary / quaternary polishing of effluent
Research & development into sustainable treatment methods for complex waste streams

The blending & generation of feedstock for off-site generation reduces haulage overall, improves AD process efficiency & helps to optimise digestate removal.

3.2 Operating techniques

- 3.2.1 The activities on site shall be operated in a manner as described in the permit documentation Schedule 1, table S1.2 unless otherwise notified by the Environment Agency.
- 3.2.2 If notified by the Environment Agency that the activities are giving rise to pollution, W4G will submit to the Environment Agency for approval within the period specified, a revision of any plan or documentation which identifies and minimises the risk of pollution relevant to that plan and shall implement the approved revised plan from the date of approval unless otherwise agreed in writing by the Environment Agency. Revised plans to prevent the cause of this rise in pollution will be instigated within agreed timescales by the Environment Agency.
- 3.2.3 The activities will be operated using the techniques as described in the detailed process description included in the site's process flows (**Reference AD process flow diagram & Corby Facility Process Flow**) The whole system is subjected to daily monitoring (if not more frequently) to ascertain digester performance and treated effluent quality.

3.3 Analysis to monitor operations.

- 3.3.1 The feedstock, pre-treatment process, exported feedstock, treated feedstock within the digesters and final effluent are all subject to the following analysis to control operations.
- 3.3.2 Pre-acceptance Analysis is completed on potential waste streams before they arrive to site. A sample is sent into our onsite laboratory for analysis to determine it's viability to our various onsite processes as well as details on the waste's source, EWC code and details on it's composition. Only on technical approval following pre-acceptance analysis may a waste be scheduled to be brought into site:

Table 8 Pre-Acceptance Analysis Carried out on Potential Waste Streams

Pre-Acceptance Analysis		
Sulphate	Suspended Solids	pH
Ammonium	Chloride	Chemical Oxygen Demand
Sulphide	% DM	BMP
Total Nitrogen	Ammonia	VFA

- 3.3.3 The above analysis is not a conclusive list of pre-acceptance testing, and further analysis both internal and external can be taken where required so that the composition of the waste stream is sufficiently understood by the site. The sample is tested for inhibitors to the AD process as well as tested for compatibility with other waste streams (**Reference Pre-Acceptance Procedure**).
- 3.3.4 On arrival of a waste stream to site, a representative sample is taken from the tanker and analysed within the on-site laboratory for the following:

Table 9 Acceptance Analysis Carried out on Potential Waste Streams Arriving at Site

Acceptance Analysis		
Sulphate	Suspended Solids	pH
Ammonium	Chloride	Chemical Oxygen Demand

In addition to this, the acceptance sample is assessed for odour potential. Should the above parameters not align with the results attained at pre-acceptance, the waste is to be rejected. If the sample from the tanker is found to be odourous, the waste is to be rejected. The acceptance analysis helps to protect site from the arrival of waste streams outside of acceptance parameters which could affect the site's processes, efficiency and quality (**Reference Acceptance & Rejection Procedure**).

The acceptance analysis forms part of the waste tracking system which tracks waste through site on its acceptance. The waste tracking system details to which tank the waste is received, where it is transferred to, how it is processed and when it leaves site (**Reference Waste Tracking System**).

Should the waste be rejected, a waste tracking form shows that the waste is rejected and a rejection form is completed as per the Acceptance & Rejection procedure (**Reference Rejection form**). Should the waste arrive at site and is non-compliant with the pre-acceptance analysis, a non-compliance form is completed which details the actions & precautions taken at site and on whether this is still to be accepted or is rejected (**Reference Non-Compliance**). Non-compliances and rejections are recorded within the site diary and the source of the waste / producer informed of the non-compliance.

3.3.5 Feed Analysis

On receiving the waste into the reception tanks, a feed analysis is conducted, providing greater detail on the waste stream received, prior to the AD process. In addition to this, a visual inspection of the waste is completed.

Table 10 Analysis carried out in received feedstocks for the AD Process

Feed Analysis		
Sulphate	Suspended Solids	pH
Ammonium	Chloride	Chemical Oxygen Demand

Should the waste be found to be outside of desired parameters following feed analysis, the waste can still be rejected and the waste disposed to an agreed and authorised alternative disposal/treatment route. Disposal/treatment route, as mentioned previously, is agreed at the pre-acceptance stage so that there is no confusion should a waste be rejected (**Reference AD Process Flow & Decision Diagram**).

The results of this analysis, prior to the AD determine how the process is to be fed, and what loading rates and retention times will be required.

3.3.6 Pre-Treatment Process for AD

During the pre-treatment process, the following parameters are tested, often repeatedly throughout hydrolysis duration of FOGs/Synthomer waste or alternate wastes requiring hydrolysis.:

Table 11 Analysis carried out during pre-treatment to optimise the process

Pre-Treatment Process	
Temperature	pH & Alkalinity
Volatile Acid Profile	Chemical Oxygen Demand

Where necessary, the hydrolysed waste can be analysed for fats, FOGs for the treatment of FOG wastes or sodium for the treatment of Synthomer (07 02 08* wastes). Where the hydrolysis of Synthomer still 5 waste is being monitored, additional checks for the breakdown of methanol (trace) are completed to track the complete removal of methanol from this waste stream.

3.3.7 Feedstock Analysis – for off-site generation at Partner sites.

The feedstock analysis detailed below is completed on all loads of feedstock leaving the facility for off-site generation. The feedstock tanks are mixed and tested to ensure an optimal feedstock blend is generated, and this includes some or if not all of the below testing. When a load is prepared, the homogenous feedstock tank is sampled at the start, middle & end whilst loading to provide a composite, representative sample of the load. In addition to the below testing, the feedstock blends (and their individual components) are sent for both inhibition analysis and Biomethane Potential testing (BMP) as well as dry matter & organic dry matter, de-watering the low strength liquid fraction.

Table 12 Analysis carried out to characterise the feedstock supplied to partner sites

Feed Analysis		
Sulphate	Dry Matter	pH
Ammonium	Chloride	Chemical Oxygen Demand

In addition, external verification is carried out on a determined number of feedstock loads produced, with a minimum of 1 sample per week per customer.

3.3.8 Reactor Conditions

Maintaining optimal reactor conditions as well as determining detailed KPI analysis is key for successful reactor operation (**Reference Daily KPI**). Daily analysis of the reactors includes the following in-house testing:

Table 13 Daily Analysis carried out on the reactors

Reactor Analysis		
Sulphides	Alkalinity	pH
Ammonia & Ammonium	Temperature	Chemical Oxygen Demand
Biogas Quality & Quantity	Volatile Fatty Acids	Chloride Concentration

The biogas quality and quantity are monitored daily to determine reactor performance but also key parameters such as oxygen concentration and H₂S concentration, both which are monitored for safety reasons as well as performance. This is monitored utilising a Geo-tech gas analyser, with reportable limits. In addition to the above, external analysis is conducted regularly at a UKAS/MCERTS accredited laboratory, including volatile fatty acid profiling, trace nutrient determination as well as reactor functionality testing.

The biogas quality is also monitored with SCADA alerts on any drop in the quality or quantity. Organic loading rates based on chemical oxygen demand are calculated for each reactor, as well as removal rates monitored. Each waste stream optimally performs with different alkalinities and volatile acid concentrations, so whilst FOS/TAC is used for conventional AD and plants run from specific ratios, W4G use both alkalinity and acids to monitor reactors and each waste is individually assessed rather than the use of a generic ratio

3.3.9 Final Effluent Quality

Maintaining final effluent quality and determining consent compliance is a critical aspect of site’s regulatory and environmental compliance. The final effluent quality must be within the consented limits on the trade effluent consent at all times, and as such it is monitored daily (and more regularly if required) to ensure compliance. The site is designed to be able to test a batch of effluent for compliance prior to discharge as well as discharge continuously. Daily analysis of the effluent leaving the plant is undertaken in-house.

Table 14 Analysis carried out on final effluent prior to discharge

Final Effluent Analysis		
Sulphide	Suspended Solids	pH
Combined Ammoniacal Nitrogen	Chloride	Chemical Oxygen Demand
Zinc	Copper	Sulphate

The temperature of the effluent is also measured, and due to the strict control of the temperature of the AD plant for process condition & optimisation, the site never approaches the temperature consented limit, as this would have a severe detrimental effect on the bacterial colony within the reactors. The trade effluent discharge from site also needs to meet flow and volume consented limits, which are monitored and controlled by SCADA.

In addition to daily monitoring, the final effluent is sampled by Anglian Water, for consent compliance as well as charging. Anglian Water analyse this sample for all the consented limits in the trade effluent consent. In turn, the duplicate sample provided is both analysed in-house for selected parameters and sent away for external analysis of all consented parameters.

3.4 High-Rate Anaerobic Digestion (AD)

- 3.4.1 Following the above operational techniques, allows for the optimisation of the anaerobic digestion process and desired removal rates, where COD is removed from the influent and converted to biogas. The set-up allows the operational flexibility to operate individual reactors to feed in series or in parallel for individual or mixed feedstocks and there is also the capacity to vary hydraulic and organic loading rates individually.
- 3.4.2 Only waste streams that can be suitably digested are processed via the high-rate AD plant. The AD plant is monitored for its loading and removal rates to prevent overloading / underloading of the reactors and to optimum performance.
- 3.4.3 The reactors are supplemented with trace elemental nutrients to ensure an optimal colony of anaerobic bacteria can develop.
- 3.4.4 The reactors are subject to daily monitoring as well as recording of feed volumes. All results are analysed & trended to determine performance.
- 3.4.5 Due to the design of the AD system, there is very little gas storage within the reactor roof domes. As soon as the gas is produced, it leaves the reactors and enters the gas line. This increases the safety of the design, as there is no significant storage of biogas (which can be explosive / flammable).
- 3.4.6 The digestate produced by the AD process is polished to achieve a low dry matter and then discharge, to sewer under a trade effluent consent. The low solids & nutrient content (due to the retention of the biological colony within the reactor), means that this digestate is not spread to land like traditional AD systems. It is also not subject to PAS 110 requirements or AD digestate protocols as it is discharged as a trade waste.
- 3.4.7 The reactors are fed through inlet valves at the bottom of the reactors and is mixed at the reactor base before the uprate flow carries the reactor feed through the bacterial colony within the reactor. Ensuring the valves and mixing are operating correctly is a daily check to ensure reactor operation. Mixing is also provided by the production of biogas within the reactor vessels.

- 3.4.8 The SCADA system controls the AD process, flow rates, temperature, pumping and recirculation. SCADA alarms which indicate changes to the process and/or equipment failure etc immediately inform operators of potential issues, as well as controlling the process to ensure safety.

3.5 Feedstock Preparation

- 3.5.1 W4G prepares feedstock for off-site generation at partnered sites and has the capacity to individually tailor these blends to the receiving plant's requirements.
- 3.5.2 Only selected waste streams and products are utilised to generate feedstock for offsite treatment.
- 3.5.3 W4G have the facility to de-water, screen, mix & decant wastes to ensure their optimum quality.
- 3.5.4 The SCADA process controls all aspects of the receiving, transferring, mixing & blending of the feedstock. Tanker reception and filling is all monitored on SCADA and also CCTV and is overseen by site personnel.
- 3.5.5 The design of the waste, and blending are all documented in procedures situated in the site off (**Reference Feedstock Analysis Form & Blending Procedures**).
- 3.5.6 Only wastes which can be received by the off-site generators are included within their feedstock blend.
- 3.5.7 Feedstock is not stored onsite for more than a week (typically 24-48 hours) and always in sealed tanks. As controlled by the pre-acceptance limits, no highly odorous wastes / feedstocks are accepted on to site. Should a waste become highly odorous, this will be removed from site immediately to prevent any odour nuisance.
- 3.5.8 In-house analysis (as well as external analysis) is completed to provide the optimal feedstock blend for each destination site's AD process. The feedstock will help to improve the plant's biology, AD performance and assist with the plant's financial viability.

3.6 Pre-Operational Conditions

- 3.6.1 Table S1.3 of the permit contains a list of improvement conditions required to be complied with. The appropriate documentation has been submitted and approved by the Environment Agency to permit the import of 07 02 08* waste into site, from Synthomer (UK) Ltd. The site has now complied and has written approval of the pre-operational requirements and is able to receive the 07 02 08* waste stream.

3.7 Waste Acceptance

Load Acceptance, Inspection and Waste Control

- 3.7.1 Pre-acceptance and acceptance analysis (including tanker sampling) will be conducted prior to formal acceptance of waste (**Reference Pre-acceptance Procedure & Acceptance and Rejection Procedures**).
- 3.7.2 Waste will be accepted to the site for treatment in accordance with the Waste Codes listed in the Environmental Permit (**Reference Permit CB3902XP**). The additional codes proposed in permit variation applications will not be received into site until permission is granted from the Environment Agency.
- 3.7.3 Non-conforming wastes will be rejected as documented in Waste Acceptance & Rejection Procedures and a Non-conformance form completed (**Reference Non-conformance Form**).

Waste Quantity Measurement System

- 3.7.4 All waste inputs & outputs shall be weighed into site using the site's weighbridge and a physical copy kept. The weighbridge is calibrated annually in line with manufacturers requirements.

- 3.7.5 Quarterly waste returns will be submitted to the Environment Agency showing the waste types and quantities received at the site for treatment and dispatched from site for treatment or disposal elsewhere.

3.8 Hazardous Waste Treatment

- 3.8.1 The EA have agreed pre-operational conditions have been met, this has facilitated the importing of hazardous waste to the site.
- 3.8.2 The pre-operational assessment required a number of Best Available Techniques (BAT) to be implemented or scheduled to further minimise potential environmental impacts.
- 3.8.3 Wastes under 07 02 08* from Synthomer (UK) Ltd, hereafter referred to as 'Synthomer Waste' are subjected to their own acceptance requirements detailed within the Acceptance & Rejection Procedure, which has additional data and testing requirements in comparison to non-hazardous waste. To facilitate the pre-acceptance of the waste, a full feasibility study has previously been undertaken for the waste stream (**Reference Acceptance & Rejection Procedure**).
- 3.8.4 W4G, in addition to permit requirements, will strictly adhere to Duty of Care requirements, as necessary for classified hazardous wastes.
- 3.8.5 Hazardous waste storage requirements are adhered to, with designated storage bays for storage, quarantine, treatment & inspection. The Synthomer waste has a dedicated acceptance procedure, meeting the BAT requirements of accepting hazardous wastes.
- 3.8.6 Synthomer waste must not exceed the site's daily total of 10 tonnes of hazardous waste incoming per day. Strict adherence to handling & PPE requirements for the operators, disciplinary action is in place for any breach of protocol.
- 3.8.7 Each IBC received requires labelling to BAT requirements and is logged within IBC tracking system. Labelling requires all potential hazards to be displayed. System to be regularly audited.
- 3.8.8 Staff induction and training required prior to operating this segregated part of the site's operations.
- 3.8.9 Synthomer waste is only to be booked in when both adequate capacity, sufficient personnel on site. The unloading, transporting, movement and treatment must be overseen by technically competent personnel. Synthomer waste has a clear rejection procedure, the contract is documented to return any out of specification batches received, and there is an additional established disposal route if required.
- 3.8.10 The Synthomer waste has a segregated reception area. No other loads destined for the indoor reception area are to be received at the same time on site. The reception, storage, processing and treatment areas are all situated on impervious surfaces.
- 3.8.11 Samples from pre-acceptance, acceptance and feed analysis must be stored for a minimum of 2 days on site following the treatment & disposal of the waste. External analysis undertaken frequently on incoming batches, utilising an MCERTS accredited laboratory.
- 3.8.12 Energy efficiency and sustainability requirements of treating the Synthomer waste will regularly be determined and monitored.
- 3.8.13 Regular assessment of the efficiency of the treatment process including the use of raw materials will be undertaken for the Synthomer, however this investigation will also be subjected to the other waste streams on site once commissioned. Site to maintain a raw materials list in regard to treatment requirements to the Synthomer waste (Strictly confidential).

- 3.8.14 The site once commissioned will be subjected to regular reviews of energy use (and production) as well as water usage, with each monthly use to be recorded.
- 3.8.15 Hazardous nature of the waste is attributed to the methanol content. This is regularly analysed by an MCERTS laboratory to monitor against STOT toxicity/hazardous rating as well as methanol destruction rates through hydrolysis. Regular reviews of operator PPE and handling requirements.

3.9 Site Drainage

- 3.9.1 As part of the site's upgrades, a CIRIA 736 assessment has been undertaken on the site and a detailed bunding and drainage plan has been assessed. The site is designed to ensure that no spillages will contaminate the surface water nor reach outside the site boundary. Any potential spills on site will be immediately cleaned up.
- 3.9.2 The yard area is fully contained within an ACO drainage system, as shown on the Site Layout Plan (Drawings 1 & 3). The reactors are contained within a fully bunded area which is chemical resistant. 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 be returned for use in the Anaerobic Digestion process. The drainage strategy is shown on the Site Layout Plan Drawing (Drawings 1 & 3).
- 3.9.3 Wastes can be stored both with IBCs or within tanks within the warehouse following site upgrades. The warehouse is both bunded and sloped towards the AD plant at the rear of the site. This slope directs any potential spillages to the allocated site drainage at the back of the warehouse, where any potential spillages are collected via submersible pump.
- 3.9.4 The entire site is bunded to prevent any spillages leaving site or any waste affecting the surface waters. All surface waters are collected and processed through the plant. Should there be extremely high rainfall expected, the Spillage & Drainage procedure will be adopted where a submersible pump is set up in the site collection drain in cases where exceedingly high run-off is expected. The weather conditions & forecasts are monitored by operational staff to assist in fore-seeing any potential problems (**Reference Spillage & Drainage Procedures**).
- 3.9.5 Where a spillage occurs which affects either the surface water or leaves the site boundary, the EA (as well as Anglian Water) are to be informed, as detailed within the reporting system.

3.10 Decommissioning & Permit Surrender

- 3.10.1 A Decommissioning Plan will be implemented in the event that the operator decides to vacate the site. In brief, should the company stop trading or be dissolved, no more waste will be imported into site, the site is to continue until all waste has been processed, and the reactors are made safe. System purged and reactors drained down as far as possible with the effluent in consent. Biomass and remaining effluent is to then be tankered from site to an approved authorised AD facility. It is in both the staff contracts as well as in director's agreement to ensure plant safety on dissolution of the company.
- 3.10.2 W4G will amend the Site Condition Report to include surrender requirements and a permit surrender application for submission to the Environment Agency. It is understood that the surrender application will not be approved by the Environment Agency unless it can be demonstrated that the land and groundwater are in a no worse condition than when the permitted activities commenced.

4 EMISSIONS AND MONITORING

4.1 Emissions to Water, Air or Land

- 4.1.1 Emissions to air, water & land have been assessed for the facility. An Environmental Risk Assessment (**Reference Environmental Risk Assessment**) of the impacts the activities from the process and / or by accidents/incidents may have on the environment has been undertaken in support of the application for the environmental permit variation, this includes point source and fugitive emissions (Drawing 2 & 4).
- 4.1.2 Point source emissions have also been included within a H1 assessment; there are no additional emission points for the Installation site.
- 4.1.3 The emission sources detailed for monitoring in our permit include:

Table 15 Emission points on site

Point Source Emissions			
Source	Pathway	Source	Pathway
CHP Engine	Air	Reactors (Pressure Relief Valves)	Air
2 No. Emergency Flare	Air	Oil/Fuel Storage Tank	Air
Auxiliary Boiler	Air	Methane Scrubber	Air
Drain to Sewer (Trade Effluent)	Sewer/Water		

- 1.1.2 Emissions monitoring is to be undertaken routinely onsite including throughout commissioning. Both the flare stack(s) and CHP engine are monitored as part of the maintenance contract with the supplier.
- 4.1.4 There are no emissions to air, water or land except those documented in the Schedule 3 tables of the permit, S3.1, S 3.2 and S 3.3.
- 4.1.5 The limits in schedule 3 shall not be exceeded.

4.2 Emissions to Groundwater

- 4.2.1 There are no emissions from the activities to groundwater.

4.3 Control of Emissions to Land and Water

- 4.3.1 All liquids in containers, whose emission to water or land could cause pollution, shall be provided with secondary containment, unless the operator has used other appropriate measures to prevent or where that is not practicable, to minimise, leakage or spillage from the primary container.
- 4.3.2 A 'spill kit' is located in the site office and spill kit station at the fuel tank. Spillages from vehicle leaks or accidents or spills from the fuel storage area will be cleaned up using the spill kit and 'Leaks and Spills Action Plan' as soon as possible. Spent granules will be stored in a sealed container on impermeable pavement in a bunded area and will be disposed of to an appropriately authorised facility as soon as practicable.

4.3.3 Oil/fuel which is stored on site in an appropriate tank within a bund that is 110% of the capacity of the tank. All fuelling nozzles are located within the storage area. The bund and tank will be regularly inspected to ensure there are no leaks and that the bund is not filling with rain water, which is emptied and cleaned out as required.

4.4 Pests

- 4.4.1 The permit requires that the activities on site will not give rise to pests which are likely to cause pollution, hazard or annoyance outside the site. The operator shall not be taken to have breached this condition if appropriate measures, including but not limited to any approved pest’s management plan.
- 4.4.2 Due to the nature of the waste types received and the fully contained system operated on site, pests are deemed to be a low risk. However there is a specialist pest control contractor in place to routinely monitor the site for pests. Bait boxes are strategically placed around site and further control measures will be employed as required. Any pest sightings are recorded within the site diary and site management informed.
- 1.1.3 The presence of pests was assessed in both the H1 risk assessment and the environmental risk assessment in regard to how fugitive emissions could potentially attract pests and it was assessed to be very low risk. Pests were assessed in the environmental risk assessment for all potential pathways, and all risks found to be low due to the sealed nature of the tanks, the through-put on site, and the cleaning & storage procedures in place.
- 1.1.4 The site cleaning & hygiene procedures are in place to actively address the presence of pests. The site is cleaned daily, (with any spillages cleaned up immediately) and any reported sightings of pests is escalated immediately, to the external pest control contractor. The management of the plant includes a site cleaning regime and the use of external pest control, which has proven to date to be highly effective (**Reference Site Cleaning & Hygiene Procedures**).

4.5 Odour

4.5.1 The permitted requirements require that the emissions from permitted activities shall be free of odour at levels likely to cause pollution outside the site.

Due to the nature of the waste to be received at the site, there is a comprehensive odour management plan in place to mitigate against the risk of odour. The extant odour management plan was approved by the Environment Agency. In line with site upgrade work, a revised odour management plan has been developed demonstrating BAT techniques. This is based on a recent odour risk assessment⁴.

Table 16 Potential odour emission points

Potential Sources of Odour Emissions					
Point	Source	Point	Source	Point	Source
1	Roller Shutter Doors 1	2	Solids Bay 1	3	RT1 Loading Bay
4	Roller Shutter Doors 2	5	Onsite Pumping Station	6	Odour Scrubber
7	Feedstock Reception	8	RT2 Reception	9	Flare(s)

⁴ Odour Risk Assessment

10	CHP	11	ABP/MB	12	Main Break Tank
13	Reactor 1 Nano Bubble Treatment	14	Reactor 6 Feedstock Storage	15	Grey Feedstock Tank
16	Gold Feedstock Tank	17	White Feedstock Tank	18	R&D Plant for Leachates, FOG & Complex Wastes
19 - 22	Reactor PRVs	23 - 28	Reactor Overflows	29	Inlet DAF (1)
30	DAF Break Tank	31	Effluent DAF (2)	32	Complex DAF (3)
33	FOG Storage Tank	34	DAF 3 Break Tank	35	Heating Oil Storage Tank
36	Boiler	37	TF 1 Tank Farm	38	TF9 Tank Farm

4.5.2 If notified by the EA, that activities are giving rise to pollution outside the site due to odour, W4G shall submit to the EA for approval within the period specified, an odour management plan that has been amended to identify, minimise and remove the risks of pollution from odour.

4.5.3 Once approved, W4G will implement the approved odour management plan and mitigation measures within the agreed timescales.

4.6 Bioaerosols

4.6.1 A bioaerosol risk assessment⁵ was carried out in April 2023 and concluded that residual risk would be low to the site's potential receptors following our mitigation and abatements methods, and that no further abatement requirements would be required on the site.

4.7 Noise and vibration

4.7.1 The permit requires that the emissions from all activities shall be free from noise and vibration at levels likely to cause pollution outside the site.

4.7.2 The waste activities on site are not noisy. The only piece of plant on site that has the potential to generate noise is the CHP engine. The CHP engine is relatively small, only having a capacity of 150kW. The CHP is contained within acoustically insulated shipping container. All the other plant and equipment produces minimal amounts of noise. An external noise report has been conducted to verify baseline levels as well noise from surrounding areas and the CHP would not cause noise or vibration nuisance.

4.7.3 Noise assessment was undertaken as part as the Environmental Risk Assessment (Fugitive Emissions, Noise etc.) and all potential sources of noise were found to be low risk, and below surrounding baseline levels.

4.7.4 In light of the site upgrades and increased traffic movement into site, W4G have conducted a noise & vibration assessment to ensure and which determined that sensitive receptors would not be affected.⁶

⁵ Bioaerosol risk assessment April 2023

⁶ Noise Assessment Document December 2022

4.8 Monitoring

- 4.8.1 The permit specifies the required monitoring schedules and frequencies in tables S3.1, S3.2 & S3.3.
- 4.8.2 There is a requirement for emission monitoring for the permitting activities. This will be undertaken as part of maintenance contracts with suppliers of equipment such as the CHP, boiler & flare. All emissions monitoring results will be documented and assessed to determine if results are within permitted requirements. If outside of permitted limits, abatement measures for equipment can be installed as well as determining if plant is operating within optimum parameters.
- 4.8.3 The monitoring of carbon scrubbers, ozone scrubbers and other odour abatement technology is detailed within the odour management plan. Should a reading be detected, i.e. a reading above zero, the trigger level is breached and the media changed/maintenance undertaken. Similarly, with the daily sniff testing, if any odour is detected, it is automatically flagged with site manager and changes implemented.
- 4.8.4 All records of media changes, instrument calibration, servicing as well as monitoring are to be documented.
- 4.8.5 Emission monitoring will be to a required standard as documented in the permit i.e. MCERTS accreditation.
- 4.8.6 Permanent means of access is available to enable sampling/monitoring.

5 INFORMATION

5.1 Records

- 5.1.1 All records required to be made by the Management System and the environmental permit will be retained at the operator's site office for a minimum of 6 years unless otherwise stated. Copies of waste transfer/consignment notes will be retained at the site office for a minimum of 6 years.
- 5.1.2 All records required in regard to the permit must be legible, made as soon as reasonably practicable, and retained for a minimum of 6 years.
- 5.1.3 If records requirement amendment, the records must be amended in such a way that the original and any such subsequent amendments remain legible or are capable of retrieval.
- 5.1.4 A site diary and daily site checklist will be kept to record the following:

Table 17 Actions recorded within the Daily checklist

Daily Actions Recorded / Checklist		
Accidents	Meter Readings	KPIs
Incidents / Emergencies on Site	Emissions Testing	Site Inspections (EA/Internal Checks)
Time on site (COTC/WAMITAB)	Sniff Testing & Odour Emissions	Site Infrastructure Check & Remedial
Waste received & storage capacity	Pest Sightings	Action taken in regard to complaints
Maintenance Undertaken	Operational Parameters	Contingency Plan Actions

5.2 Reporting

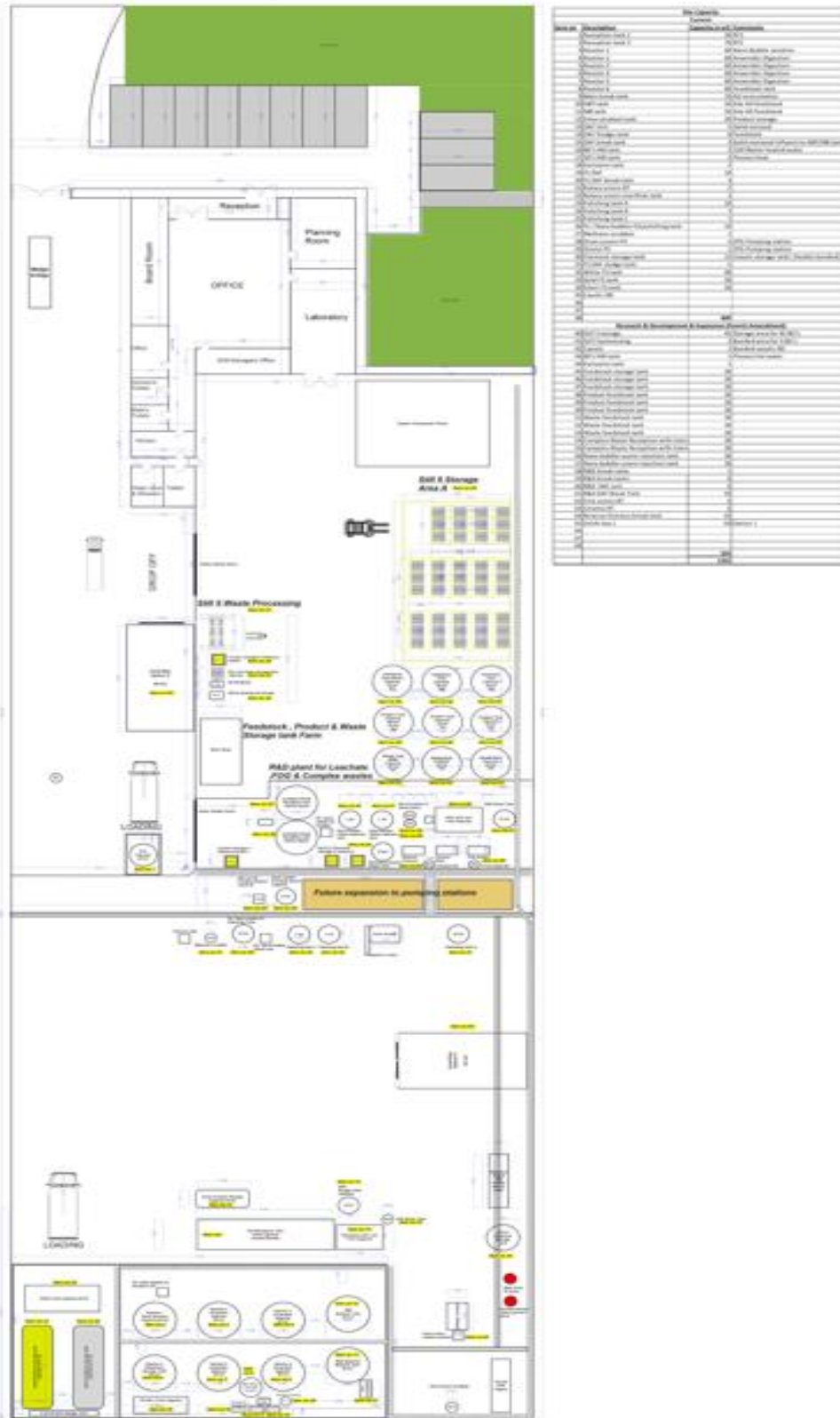
- 5.2.1 W4G will send all reports and notifications required by the permit to the Environment Agency.
- 5.2.2 Quarterly waste returns (identifying quantities of waste in to and out of the site) will be submitted to the Environment Agency within 1 month of the end of each quarter and retained for a minimum of 6 years.
- 5.2.3 Within 28 days of the end of the reporting period, W4G shall, unless otherwise agreed, submit reports of the monitoring & assessment carried out.
- 5.2.4 An identification board will be visible from the site entrance indicating a contact number for who to contact in an out of hours emergency, the permit number, the operator and the opening hours.
- 5.2.5 Training records will be maintained for all staff and retained for the duration of employment.
- 5.2.6 Training to include hazardous waste treatment in following the pre-operational requirements for the treatment of 07 02 08* (Synthomer) waste.
- 5.2.7 Copies of notifications of incidents, accidents and complaints made to the Environment Agency as a notification will be retained for 6 years.

5.3 Notifications

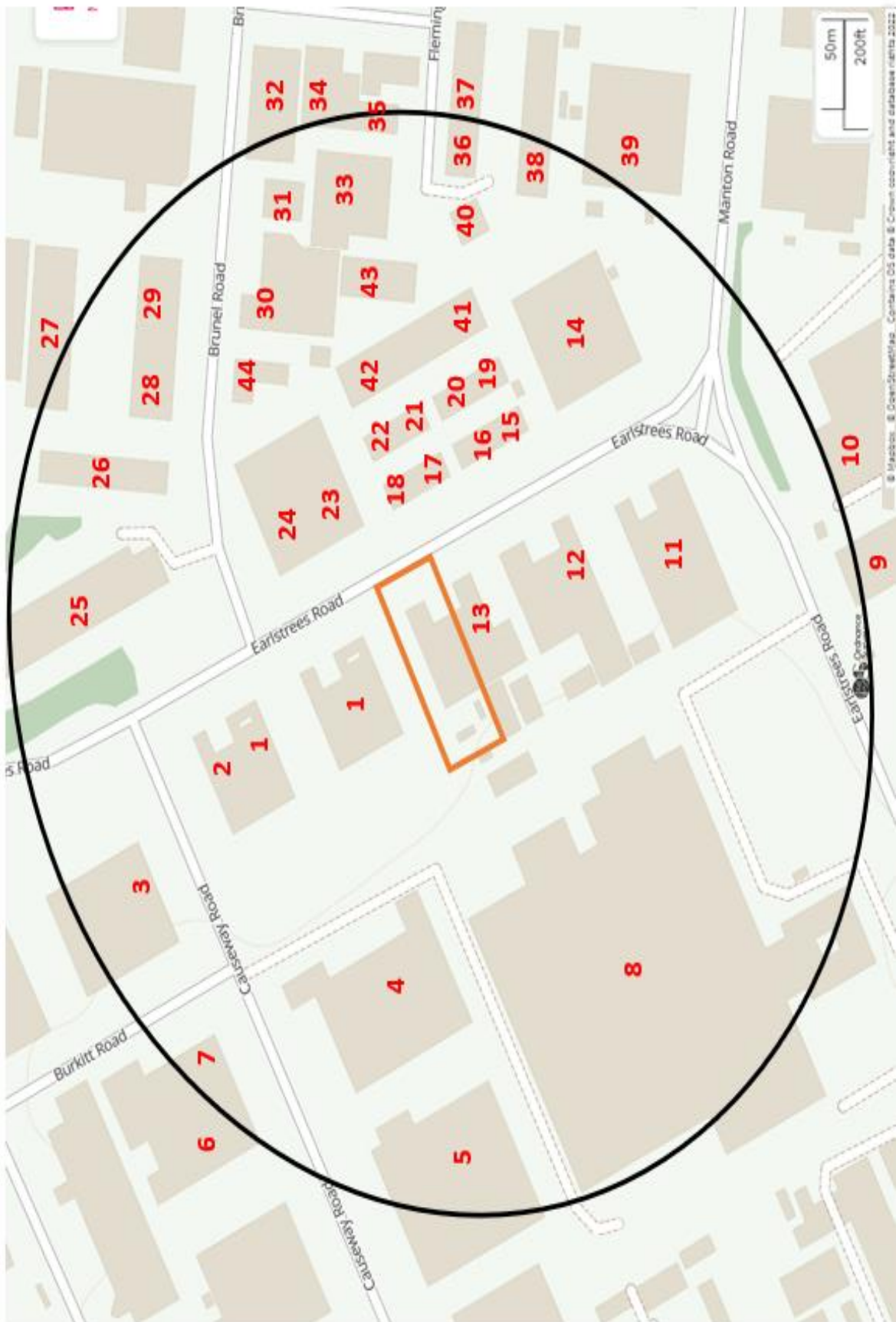
- 5.3.1 The EA will be notified using the Notification form in Schedule 5 to the environmental permit of any breakdown of essential equipment or severe weather condition as soon as possible.
- 5.3.2 The EA will be notified using the Notification form in Schedule 5 to the environmental permit of any breach of a limit specified within the permit.
- 5.3.3 W4G will inform the EA of information required within the agreed time period.
- 5.3.4 On request of sampling, W4G will inform the EA when the sampling is to take place, and at least 14 days prior to commencement of monitoring.
- 5.3.5 If the operator changes the registered company trading name, registered office address or takes steps to go into administration, the operator will inform the Environment Agency within 14 days.

6 Associated Documents & Drawings

6.1 Drawing 1: Site Layout

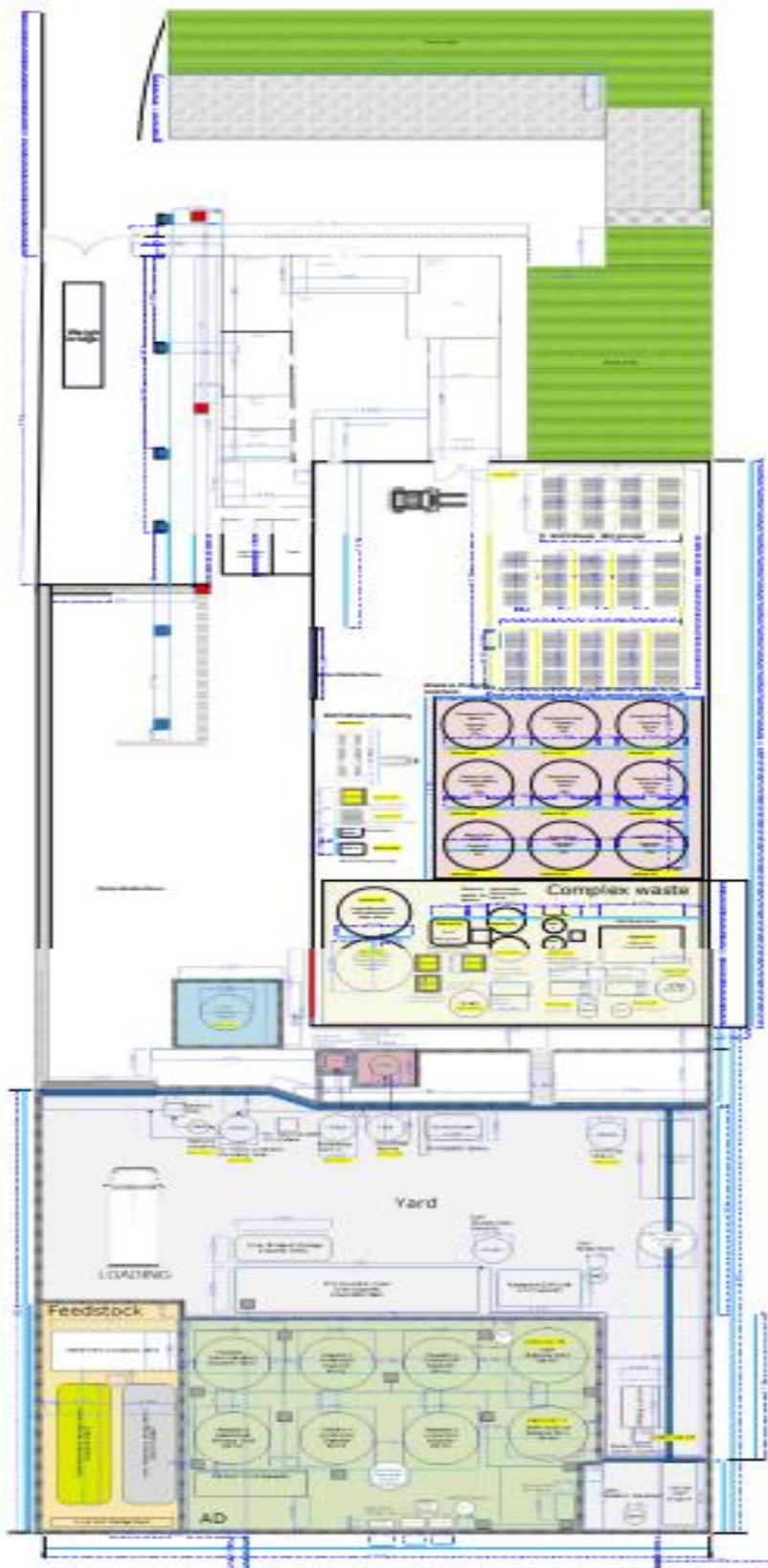


6.2 Drawing 2: Receptor Plan



10	Business	- Low (e.g., footpath, road) - Medium (e.g., industrial or commercial workplaces) - High (e.g., housing, pub/hotel etc)
1	Saint Gobain, HPM Tape Solutions	Medium
2	Northamptonshire Pallets	Medium
3	Tablecraft	Medium
4	Taste Original Food Concepts Puredrive Fine Foods	Medium
5	Quantum Windows	Medium
6	SKG CRP Display Corby	Medium
7	Cartell-UK	Medium
8	Avon	Medium
9	Robinsons auto logistics	Medium
10	Weetabix Corby 2	Medium
11	AJB Group	Medium
12	Astrabridge Ltd	Medium
13	Indian Hub	Medium
14	HC Forklifts UK/Impact Cat	Medium
15	ULV Sanitise	Medium
16	Shuttercraft Northants	Medium
17	TBC	
18	ECS electricals compliance & safety	Medium
19	Intrinsic Systems	Medium
20	AVUS Consulting	Medium
21	The Chartered Institute of Logistics and Transport	Medium
22	The Chartered Institute of Logistics and Transport	Medium
23	J M J Bulk Packaging	Medium
24	Impact Handling	Medium
25	<ul style="list-style-type: none"> o Mida's Autos o Geddington Service Station <ul style="list-style-type: none"> o Retro Ford o Paula's Diner o Scuffs 'n' Buffs o County Powder Coaters 	Medium Medium High Medium Medium
26	<ul style="list-style-type: none"> o Valour Performance Technology o Archtile 	Medium Medium
27	SR MOT and Service Centre	Medium
28	EPM Engineering Group	Medium
29	Agenta Education	Medium
30	Impact Fork Trucks	Medium
31	Made Interiors	Medium
32	Foodmaker	Medium
33	Corby Gymnastics Academy	Medium
34	Blinds Outlet	Medium
35	4Sure	Medium
36	MIKs Garage	Medium
37	Apex Glass	Medium
38	Waterworks Window Cleaning	Medium
39	Orchard House Factory 5	Medium
40	North Northamptonshire Council	Medium
41	Premier Roofing Systems/Draper Group	Medium
42	Advantage Cover Fabrications	Medium
43	Impact Fork Trucks	Medium
44	Chemi-Supply Ltd	Medium

6.3 Drawing 3: Drainage Plan



6.4 Drawing 4: Emission Point Sources

