Notice of Variation and Consolidation with introductory note

The Environmental Permitting (England & Wales) Regulations 2016

Yorkshire Water Services Limited

Esholt Sludge Treatment Facility
Ainsbury House
The Avenue
Idle
Bradford
West Yorkshire
BD10 0TW

Variation application number

EPR/VP3130GZ/V005

Permit number

EPR/VP3130GZ

Esholt Sludge Treatment Facility
Permit number EPR/VP3130GZ

Introductory note

This introductory note does not form a part of the permit

Under the Environmental Permitting (England & Wales) Regulations 2016 (schedule 5, part 1, paragraph 19) a variation may comprise a consolidated permit reflecting the variations and a notice specifying the variations included in that consolidated permit.

Schedule 1 of the notice specifies the conditions that have been varied and schedule 2 comprises a consolidated permit which reflects the variations being made. All the conditions of the permit have been varied as a result of the operator's application and are subject to the right of appeal.

Changes introduced by this variation

The Industrial Emissions Directive (IED) came into force on 7 January 2014 with the requirement to implement all relevant Best Available Techniques (BAT) Conclusions as described in the Commission Implementing Decision. The schedule of waste management activities includes the recovery of non-hazardous waste with a capacity exceeding 75 tonnes per day (or 100 tonnes per day if the only waste treatment activity is anaerobic digestion) involving biological treatment, but excludes activities covered by the Urban Waste Water Treatment Regulations (UWWTR). However, UK environmental regulators concluded that the biological treatment of waste sewage sludge is not an activity covered by the UWWTR and is therefore within the scope of the IED. The BAT Conclusions for Waste Treatment (the BREF) was published on 17 August 2018 following a European Union wide review of BAT, implementing decision (EU) 2018/1147 of 10 August 2018. BAT applies to new waste sewage sludge treatment not covered by the UWWTR. The operations at Esholt Sludge Treatment Facility (STF) are existing but will be brought into environmental regulation for the first time and are required to operate using BAT.

This variation amends the permit to add a Section 5.4 Part A (1)(b)(i) scheduled activity to become an installation. The currently permitted Combined Heat and Power (CHP) activity will become a directly associated activity to the Section 5.4 Part A (1)(b)(i) scheduled activity. Also, as part of this variation Yorkshire Water Services Limited will bring a gas connection onto site to provide mains natural gas, and CHP 1 (emission point A5) will be converted to natural gas as its sole fuel source. Site will also add a biogas dehumidifier to site, with the condensate draining to emission point S1. Improvements to the sludge screening will also be undertaken with the existing Rotamat rotating screens being replaced with enclosed Huber strain presses.

Brief description of the process

Esholt STF is located approximately 6.7km northeast of Bradford city centre. The facility is in the grounds of the wider Esholt Wastewater Treatment Works (WwTW) operated under the UWWTR. The central point of the site is NGR SE 18684 39435. The site is split up into two main sections, the digester area and the digested sludge area. These are connected with a pipeline. The nearest residential receptors are located outside the installation boundary to the east and are approximately 430m from the sites operational area. The River Aire runs through the site.

This site will accept sewage sludge produced at Esholt WwTW (indigenous sludge and surplus activated sludge (SAS)), and sewage sludge produced at Yorkshire Water satellite sites (imported liquid sludge and imported cake introduced) via two dedicated import areas. The indigenous primary sludge and imported liquid sludge go to the sludge screen feed tank where it is screened. Air is extracted from the sludge screen feed tank by odour control unit (OCU 1) at emission point A10. The sludge is then pumped to consolidation tank 5 via the sludge transfer pumping station, where the sludge is blended and mixed using air injection. Air is extracted from the sludge transfer station at consolidation tank 5 by two proposed future OCU's numbered 5 and 7 at emission points A15 and A17 respectively.

Indigenous SAS arising from the sewage treatment process enters from two SAS storage tanks (which do not form part of the installation boundary) and passes to the four drum thickeners where the sludge is thickened with the addition of polymers to aid the thickening process. From here it is transferred into the two SAS transfer tanks. Liquor produced in the thickening process is returned to the WwTW by the liquor return supernatant pumping station via emission point S2. From the SAS transfer tanks, the thickened SAS is then pumped to the two mixed sludge tanks where it is mixed with the indigenous primary and imported liquid sludges. These tanks have an air mixing system to prevent settlement and septicity. Air is extracted from the two SAS transfer tanks and two mixed sludge tanks by OCU 2 at emission point A11. From the mixed sludge tanks, sludge is transferred to the three dewatering centrifuges, where polymer is added. Liquid centrate produced here is returned to the WwTW by the liquor pumping station via emission point S2.

Imported sludge cake is tipped from an enclosed wagon to the dedicated sludge cake reception area, sludge is moved from the sludge cake hopper and is rewetted with final treated effluent and pumped to the two Thermal Hydrolysis Plant (THP) feed silos. Air is extracted from the cake import sludge unit by proposed future odour control unit (OCU 6) at emission point A16.

Dewatered sludge from the three dewatering centrifuges also enters the two THP feed silos with the imported sludge cake, and then is transferred to the THP hopper. The sludge then passes to the THP which is comprised of 6 reactor vessels which operate in pairs. Each pair of reactors operates a batch as follows: a reactor pair is filled with dewatered sludge and heated to around 165°C using steam generated by the boilers. The reactors are held at this temperature for 30 minutes and act like a pressure cooker to break down organic matter in the sludge making it more digestible for the microbes in the anaerobic digesters. After 30 minutes the steam is flashed out to the next pair of reactors and the reactor tanks are emptied. Air is extracted from the two THP feed silos, THP feed hopper and the dewatering centrifuges pumping station by OCU 3 at emission point A12.

Following THP, sludge is transferred to a buffer tank and then to the four digesters via the digest feed lines. The sludge undergoes biological treatment in the form of mesophilic anaerobic digestion (AD) in four digesters. The treatment of sludge in a biological AD process is a Section 5.4 Part A (1)(b)(i) scheduled activity of the above regulations. This variation adds the section 5.4 A (1)(b)(i) AD activity to the permit. Sludge extracted from the digesters is then transferred to the two degassing tanks, where any biogas is extracted as part of the biogas system.

Biogas produced as part of the AD process is stored in two gas bags prior to being used as a fuel in three combined heat and power (CHP) engines. CHP 2 (A6), CHP 3 (A1) and CHP 4 (A3) have a thermal input of 1.53 MWth, 3.63 MWth and 3.63 MWth respectively. CHP 1 (A5) has been converted to natural gas and has a thermal input of 1.53 MWth. The electrical energy and heat produced is used to power on-site processes. There are also two auxiliary boilers (A2 and A4) fuelled on either biogas or natural gas with a thermal input of 6.2 MWth each, which provides heat to the AD process. In addition to the two composite boilers is a waste heat recovery (WHR) boiler, this has no firing capacity but recovers heat from CHP 1 and CHP 2 gases to generate steam for the THP as well as hot water which feeds the Low Temperature Hot Water (LTHW) ring main. The CHP's and boilers discharge via the same 15m high stack located adjacent to the boiler house. Biogas condensate produced from biogas system is discharged to sewer and returned to the Esholt WwTW by emission point S1. In the event of an emergency, biogas is flared in a waste gas burner.

Following AD treatment, the digested sludge goes to the digested sludge area via a pipeline that crosses the River Aire. There are two separate sets of facilities for the digested sludge dewatering.

The first, which is used preferentially, is known as the sludge export facility. Sludge is transferred to two export dewatering tanks which have air mixing systems to prevent settlement and is then transferred to the two dewatering centrifuges where polymer is added and cake is produced. Dewatered liquor produced in the process is returned to the WwTW via a pumping station and emission point S3. The final digested and dewatered sludge cake is transferred to the cake pad, with water draining to emission point S1.

The second digested sludge dewatering process provides additional capacity within the conditioning area. From the degassing tanks, sludge enters two conditioning dewatering feed tanks which have air mixing systems to prevent settlement and is then transferred to the three dewatering centrifuges where polymer is added and cake is produced. Dewatered liquor produced in the process is returned to the WwTW via a pumping station and emission point S3. The final digested and dewatered sludge cake is transferred to the

open sided cake export barn via conveyors. The whole area under the conveyer and sludge cake barn is an engineered impermeable surface, with water draining to emission point S1.

Cake is stored on the dedicated cake pad or within the cake barn prior to being exported offsite for land spreading under the Sludge (Use in Agriculture) Regulations (SUiAR) and undergoes quality assurance under the Biosolids Assurance Scheme (BAS).

The site will operate seven OCU's; OCU 1 to OCU 4 are existing and all consist of a single stage active carbon adsorption filters, and OCU 5 to OCU 7 are proposed future assets all consisting of a single stage active carbon adsorption filter implemented in line with improvement conditions IC5.

There is one Special Area of Conservation (SAC), one Special Protection Area (SPA), one Site of Special Scientific Interest, fifteen Local Wildlife Site (LWS) and ten Ancient Woodlands (AW) within relevant screening distance.

The schedules specify the changes made to the original permit.

The status log of the permit sets out the permitting history, including any changes to the permit reference number.

Status log of the permit		
Description	**Date**	**Comments**
Permit determined EPR/VP3130GZ/A001	25/11/2008	Permit issued to Yorkshire Water Services Limited.
Permit determined EPR/VP3130GZ/V002	07/06/2010	Administrative variation to make Esholt site permit consistent with other Yorkshire Water Services CHP installation permits.
Permit determined EPR/VP3130GZ/V003	26/04/2012	Variation to increase carbon monoxide ELV as a result of engine management system optimisation to minimise NOx.
Permit determined EPR/VP3130GZ/V004	07/12/2012	Variation to change the permitted area to enable installation of two new engines and relocation of existing engines and allow the importation of waste from satellite stations.
Variation application EPR/VP3130GZ/V005	Duly made 22/10/2024	Variation to add an anaerobic digestion facility at a waste sewage sludge treatment site.
Additional information received	05/12/2024	Response to Schedule 5 notice dated 08/11/2024 including pressure relief valve information and revised Figure 3 principal emissions point site plan.
Additional information received	11/12/2024	Response to Schedule 5 notice dated 08/11/2024 including revised odour management plan, revised secondary containment report, revised main text supporting information, revised flow diagram and revised MCP directive requirements.
Additional information received	16/12/2024	Response to Schedule 5 notice dated 08/11/2024 including revised Figure 2 site layout plan.
Variation and consolidation determined EPR/VP3130GZ/V005	27/01/2025	Permit issued to Yorkshire Water Services Limited.

End of introductory note

Notice of variation and consolidation

The Environmental Permitting (England and Wales) Regulations 2016

The Environment Agency in exercise of its powers under regulation 20 of the Environmental Permitting (England and Wales) Regulations 2016 varies and consolidates

Permit number

EPR/VP3130GZ

Issued to

Yorkshire Water Services Limited ("the operator"),

whose registered office is

Western House
Halifax Road
Bradford
West Yorkshire
BD5 2SZ

company registration number **02366682**

to operate an installation at

Esholt Sludge Treatment Facility
Ainsbury House
The Avenue
Idle
Bradford
West Yorkshire
BD10 0TW

to the extent set out in the schedules.

The notice shall take effect from 27/01/2025.

Name	Date
Maxine Evans	**27/01/2025**

Authorised on behalf of the Environment Agency

Schedule 1

All conditions have been varied by the consolidated permit EPR/VP3130GZ/V005 as a result of the application made by the operator.

Schedule 2 – consolidated permit

Consolidated permit issued as a separate document.

Permit

The Environmental Permitting (England and Wales) Regulations 2016

Permit number

EPR/VP3130GZ

This is the consolidated permit referred to in the variation and consolidation notice for application EPR/VP3130GZ/V005 authorising

Yorkshire Water Services Limited ("the operator")

whose registered office is

Western House
Halifax Road
Bradford
West Yorkshire
BD5 2SZ

company registration number **02366682**

to operate an installation at

Esholt Sludge Treatment Facility
Ainsbury House
The Avenue
Idle
Bradford
West Yorkshire
BD10 0TW

to the extent authorised by and subject to the conditions of this permit.

Name	Date
Maxine Evans	**27/01/2025**

Authorised on behalf of the Environment Agency

Conditions

1 Management

1.1 General management

1.1.1 The operator shall manage and operate the activities:

(a) in accordance with a written management system that identifies and minimises risks of pollution, including those arising from operations, maintenance, accidents, incidents, non-conformances, closure and those drawn to the attention of the operator as a result of complaints; and

(b) using sufficient competent persons and resources.

1.1.2 Records demonstrating compliance with condition 1.1.1 shall be maintained.

1.1.3 Any person having duties that are or may be affected by the matters set out in this permit shall have convenient access to a copy of it kept at or near the place where those duties are carried out.

1.1.4 The operator shall comply with the requirements of an approved competence scheme.

1.2 Energy efficiency

1.2.1 The operator shall:

(a) take appropriate measures to ensure that energy is used efficiently in the activities;

(b) review and record at least every four years whether there are suitable opportunities to improve the energy efficiency of the activities; and

(c) take any further appropriate measures identified by a review.

1.3 Efficient use of raw materials

1.3.1 The operator shall:

(a) take appropriate measures to ensure that raw materials and water are used efficiently in the activities;

(b) maintain records of raw materials and water used in the activities;

(c) review and record at least every four years whether there are suitable alternative materials that could reduce environmental impact or opportunities to improve the efficiency of raw material and water use; and

(d) take any further appropriate measures identified by a review.

1.4 Avoidance, recovery and disposal of wastes produced by the activities

1.4.1 The operator shall take appropriate measures to ensure that:

(a) the waste hierarchy referred to in Article 4 of the Waste Framework Directive is applied to the generation of waste by the activities; and

(b) any waste generated by the activities is treated in accordance with the waste hierarchy referred to in Article 4 of the Waste Framework Directive; and

(c) where disposal is necessary, this is undertaken in a manner which minimises its impact on the environment.

1.4.2 The operator shall review and record at least every four years whether changes to those measures should be made and take any further appropriate measures identified by a review.

2 Operations

2.1 Permitted activities

2.1.1 The operator is only authorised to carry out the activities specified in schedule 1 table S1.1 (the "activities").

2.1.2 The activities shall be undertaken in accordance with best available techniques.

2.1.3 All process plant and equipment shall be commissioned, operated and maintained and shall be fully documented and recorded in accordance with the manufacturer's recommendations.

2.1.4 Waste authorised by this permit shall be clearly distinguished from any other waste on the site.

2.2 The site

2.2.1 The activities shall not extend beyond the site, being the land shown edged in green on the site plan at schedule 7 to this permit.

2.3 Operating techniques

2.3.1 The activities shall, subject to the conditions of this permit, be operated using the techniques and in the manner described in the documentation specified in schedule 1, table S1.2, unless otherwise agreed in writing by the Environment Agency.

2.3.2 If notified by the Environment Agency that the activities are giving rise to pollution, the operator shall submit to the Environment Agency for approval within the period specified, a revision of any plan or other documentation ("plan") specified in schedule 1, table S1.2 or otherwise required under this permit which identifies and minimises the risks of pollution relevant to that plan, and shall implement the approved revised plan in place of the original from the date of approval, unless otherwise agreed in writing by the Environment Agency.

2.3.3 Any raw materials or fuels listed in schedule 2 table S2.1 shall conform to the specifications set out in that table.

2.3.4 Waste shall only be accepted if:

(a) it is of a type and quantity listed in schedule 2 table S2.2; and

(b) it conforms to the description in the documentation supplied by the producer and holder.

(c) the facility has sufficient free capacity to store and treat the waste.

2.3.5 The operator shall ensure that where waste produced by the activities is sent to a relevant waste operation, that operation is provided with the following information, prior to the receipt of the waste:

(a) the nature of the process producing the waste;

(b) the composition of the waste;

(c) the handling requirements of the waste;

(d) the hazardous property associated with the waste, if applicable; and

(e) the waste code of the waste.

2.3.6 The operator shall ensure that where waste produced by the activities is sent to a landfill site, it meets the waste acceptance criteria for that landfill.

2.3.7 Waste pre-acceptance and acceptance procedures shall be undertaken in accordance with best available techniques.

2.3.8 For the following activities referenced in schedule 1, table S1.1 (AR4):

(a) each MCP must be operated in accordance with the manufacturer's instructions and records must be made and retained to demonstrate this.

(b) the operator must keep periods of start-up and shut-down of the combustion plant as short as possible.

(c) there shall be no persistent emission of 'dark smoke' as defined in section 3(1) of the Clean Air Act 1993.

2.4 Improvement programme

2.4.1 The operator shall complete the improvements specified in schedule 1 table S1.3 by the date specified in that table unless otherwise agreed in writing by the Environment Agency.

2.4.2 Except in the case of an improvement which consists only of a submission to the Environment Agency, the operator shall notify the Environment Agency within 14 days of completion of each improvement.

3 Emissions and monitoring

3.1 Emissions to water, air or land

3.1.1 There shall be no point source emissions to water, air or land except from the sources and emission points listed in schedule 3 tables S3.1, S3.2 and S3.3.

3.1.2 The limits given in schedule 3 shall not be exceeded.

3.1.3 Periodic monitoring shall be carried out at least once every 5 years for groundwater and 10 years for soil, unless such monitoring is based on a systematic appraisal of the risk of contamination.

3.2 Emissions of substances not controlled by emission limits

3.2.1 Emissions of substances not controlled by emission limits (excluding odour, but including ammonia) shall not cause pollution. The operator shall not be taken to have breached this condition if appropriate measures, including, but not limited to, those specified in any approved emissions management plan, have been taken to prevent or where that is not practicable, to minimise, those emissions.

3.2.2 The operator shall:

(a) if notified by the Environment Agency that the activities are giving rise to pollution, submit to the Environment Agency for approval within the period specified, an emissions management plan which identifies and minimises the risks of pollution from emissions of substances not controlled by emission limits;

(b) implement the approved emissions management plan, from the date of approval, unless otherwise agreed in writing by the Environment Agency.

3.2.3 Subject to condition 3.2.4, below, all liquids in containers, whose emission to water or land could cause pollution, shall be provided with adequate secondary containment, unless other appropriate measures to prevent or where that is not practicable, to minimise, leakage and spillage from the primary container have been agreed in writing with the Environment Agency.

3.2.4 Condition 3.2.3, above, shall apply unless the operator strictly complies in full with IC3 below.

3.2.5 Subject to condition 3.2.6, below, all liquid wastes in storage tanks and lagoons shall be fully enclosed, with emissions collected and directed to an appropriate abatement system, unless other appropriate measures to prevent or where that is not practicable, to minimise, emissions of waste gases from storage tanks and lagoons have been agreed in writing with the Environment Agency.

3.2.6 Condition 3.2.5, above, shall apply unless the operator strictly complies in full with IC5 and IC6 below.

3.2.7 Subject to condition 3.2.8, below, the anaerobic treatment of all wastes shall take place within fully enclosed vessels. Combustible biogas or biomethane produced during biological treatment shall be utilised as a fuel or stored for utilisation off site, unless other appropriate measures to prevent or where that is not practicable, to minimise, emissions of biogas or biomethane from treatment/storage vessels have been agreed in writing with the Environment Agency. There shall be no uncontrolled emissions of biogas to the environment. This excludes the venting of biogas in an emergency using pressure release valves.

3.2.8 Condition 3.2.7, above, shall apply unless the operator strictly complies in full with IC6 below.

3.2.9 The operator shall implement a leak detection and repair (LDAR) programme to detect and mitigate the release of volatile organic compounds, including methane from diffuse sources.

3.3 Odour

3.3.1 Emissions from the activities shall be free from odour at levels likely to cause pollution outside the site, as perceived by an authorised officer of the Environment Agency, unless the operator has used appropriate measures, including, but not limited to, those specified in any approved odour management plan, to prevent or where that is not practicable to minimise the odour.

3.4 Noise and vibration

3.4.1 Emissions from the activities shall be free from noise and vibration at levels likely to cause pollution outside the site, as perceived by an authorised officer of the Environment Agency, unless the operator has used appropriate measures, including, but not limited to, those specified in any approved noise and vibration management plan to prevent or where that is not practicable to minimise the noise and vibration.

3.4.2 The operator shall:

(a) if notified by the Environment Agency that the activities are giving rise to pollution outside the site due to noise and vibration, submit to the Environment Agency for approval within the period specified, a noise and vibration management plan which identifies and minimises the risks of pollution from noise and vibration;

(b) implement the approved noise and vibration management plan, from the date of approval, unless otherwise agreed in writing by the Environment Agency.

3.5 Monitoring

3.5.1 The operator shall, unless otherwise agreed in writing by the Environment Agency, undertake the monitoring specified in the following tables in schedule 3 to this permit:

(a) point source emissions specified in tables S3.1, S3.2 and S3.3;

(b) process monitoring specified in tables S3.4a and S3.4b;

(c) bioaerosols monitoring specified in table S3.5.

3.5.2 The operator shall maintain records of all monitoring required by this permit including records of the taking and analysis of samples, instrument measurements (periodic and continual), calibrations, examinations, tests and surveys and any assessment or evaluation made on the basis of such data.

3.5.3 Monitoring equipment, techniques, personnel and organisations employed for the emissions monitoring programme and the environmental or other monitoring specified in condition 3.5.1 shall have either MCERTS certification or MCERTS accreditation (as appropriate), where available, unless otherwise agreed in writing by the Environment Agency.

3.5.4 Permanent means of access shall be provided to enable sampling/monitoring to be carried out in relation to the emission points specified in schedule 3 tables S3.1, S3.2, S3.3, S3.4a, S3.4b, S3.5 and S3.6 unless otherwise agreed in writing by the Environment Agency.

3.5.5 For the following activities referenced in Schedule 1 Table S1.1 (AR4):

(a) For existing MCP Monitoring measurements shall be carried out before the relevant compliance date or within four months of the issue date of the permit whichever is the later.

(b) In the case of new medium combustion plant, the first monitoring measurements shall be carried out within four months of the issue date of the permit or the date when the MCP is first put into operation, whichever is later.

3.5.6 Monitoring of MCP shall not take place during periods of start up or shut down.

3.6 Bioaerosols

3.6.1 The operator shall take all appropriate measures, to prevent or where that is not practicable to minimise the release of bioaerosols. Emissions of bioaerosols from the operational activities shall not exceed the emission action levels specified in table S3.5.

3.6.2 The operator shall where the emission action levels are exceeded:

(a) notify the Environment Agency and investigate and take remedial action;

(b) submit to the Environment Agency for approval within the period specified, a bioaerosols management plan which identifies and minimises the risks of pollution from bioaerosols; and

(c) implement the bioaerosols management plan from the date of approval and revise the plan periodically, unless otherwise agreed in writing by the Environment Agency.

3.7 Pests

3.7.1 The activities shall not give rise to the presence of pests which are likely to cause pollution, hazard or annoyance outside the boundary of the site. The operator shall not be taken to have breached this condition if appropriate measures, including, but not limited to, those specified in any approved pests management plan, have been taken to prevent or where that is not practicable, to minimise the presence of pests on the site.

3.7.2 The operator shall:

(a) only use approved products for pest control;

(b) treat pest infestations promptly;

(c) reject pest-infected incoming waste;

(d) if notified by the Environment Agency, submit to the Environment Agency for approval within the period specified, a pests management plan which identifies and minimises risks of pollution from pests;

(e) implement the pests management plan, from the date of approval, unless otherwise agreed in writing by the Environment Agency.

3.8 Fire prevention

3.8.1 The operator shall take all appropriate measures to prevent fires on site and minimise the risk of pollution from them including, but not limited to, those specified in any approved fire prevention plan.

3.8.2 The operator shall:

(a) if notified by the Environment Agency that the activities are giving rise to a risk of fire, submit to the Environment Agency for approval within the period specified, a fire prevention plan which prevents fires and minimises the risk of pollution from fires;

(b) implement the fire prevention plan, from the date of approval, unless otherwise agreed in writing by the Environment Agency.

3.8.3 The operator shall undertake a DSEAR assessment and maintain an accident management plan.

4 Information

4.1 Records

4.1.1 All records required to be made by this permit shall:

(a) be legible;

(b) be made as soon as reasonably practicable;

(c) if amended, be amended in such a way that the original and any subsequent amendments remain legible, or are capable of retrieval; and

(d) be retained, unless otherwise agreed in writing by the Environment Agency, for at least 6 years from the date when the records were made, or in the case of the following records until permit surrender:

(i) off-site environmental effects; and

(ii) matters which affect the condition of the land and groundwater.

4.1.2 The operator shall keep on site all records, plans and the management system required to be maintained by this permit, unless otherwise agreed in writing by the Environment Agency.

4.1.3 The operator shall maintain a record of the type and quantity of fuel used and the total annual hours of operation of each MCP.

4.2 Reporting

4.2.1 The operator shall send all reports and notifications required by the permit to the Environment Agency using the contact details supplied in writing by the Environment Agency.

4.2.2 A report or reports on the performance of the activities over the previous year shall be submitted to the Environment Agency by 31 January (or other date agreed in writing by the Environment Agency) each year. The report(s) shall include as a minimum:

(a) a review of the results of the monitoring and assessment carried out in accordance with the permit including an interpretive review of that data;

(b) the annual production/treatment data set out in schedule 4 table S4.2; and

(c) the performance parameters set out in schedule 4 table S4.3 using the forms specified in table S4.4 of that schedule.

4.2.3 Within 28 days of the end of the reporting period the operator shall, unless otherwise agreed in writing by the Environment Agency, submit reports of the monitoring and assessment carried out in accordance with the conditions of this permit, as follows:

(a) in respect of the parameters and emission points specified in schedule 4 table S4.1;

(b) for the reporting periods specified in schedule 4 table S4.1 and using the forms specified in schedule 4 table S4.4; and

(c) giving the information from such results and assessments as may be required by the forms specified in those tables.

4.2.4 The operator shall, unless notice under this condition has been served within the preceding four years, submit to the Environment Agency, within six months of receipt of a written notice, a report assessing whether there are other appropriate measures that could be taken to prevent, or where that is not practicable, to minimise pollution.

4.2.5 Within 1 month of the end of each quarter, the operator shall submit to the Environment Agency using the form made available for the purpose, the information specified on the form relating to the site and the waste accepted and removed from it during the previous quarter.

4.2.6 The operator shall keep records of non-waste materials leaving the site, including the type of material, the batch number, the date of export off-site and the tonnage exported on that date. These records shall be maintained for at least 2 years.

4.2.7 The operator shall submit an annual report detailing the efficiency of removal of non-digestible materials from feedstock prior to processing and the level of contamination in the final recovered digestate.

4.3 Notifications

4.3.1 In the event:

(a) that the operation of the activities gives rise to an incident or accident which significantly affects or may significantly affect the environment, the operator must immediately—

(i) inform the Environment Agency,

(ii) take the measures necessary to limit the environmental consequences of such an incident or accident, and

(iii) take the measures necessary to prevent further possible incidents or accidents;

(b) of a breach of any permit condition the operator must immediately—

(i) inform the Environment Agency, and

(ii) take the measures necessary to ensure that compliance is restored within the shortest possible time;

(c) of a breach of permit condition which poses an immediate danger to human health or threatens to cause an immediate significant adverse effect on the environment, the operator must immediately suspend the operation of the activities or the relevant part of it until compliance with the permit conditions has been restored.

4.3.2 Any information provided under condition 4.3.1 (a)(i), or 4.3.1 (b)(i) where the information relates to the breach of a limit specified in the permit, shall be confirmed by sending the information listed in schedule 5 to this permit within the time period specified in that schedule.

4.3.3 Following the detection of an issue listed in condition 4.3.1, the operator shall review and revise the management system and implement any changes as necessary to minimise the risk of re-occurrence of the issue.

4.3.4 Where the Environment Agency has requested in writing that it shall be notified when the operator is to undertake monitoring and/or spot sampling, the operator shall inform the Environment Agency when the relevant monitoring and/or spot sampling is to take place. The operator shall provide this information to the Environment Agency at least 14 days before the date the monitoring is to be undertaken.

4.3.5 The Environment Agency shall be notified within 14 days of the occurrence of the following matters, except where such disclosure is prohibited by Stock Exchange rules:

Where the operator is a registered company:

(a) any change in the operator's trading name, registered name or registered office address; and

(b) any steps taken with a view to the operator going into administration, entering into a company voluntary arrangement or being wound up.

Where the operator is a corporate body other than a registered company:

(a) any change in the operator's name or address; and

(b) any steps taken with a view to the dissolution of the operator.

In any other case:

(a) the death of any of the named operators (where the operator consists of more than one named individual);

(b) any change in the operator's name(s) or address(es); and

(c) any steps taken with a view to the operator, or any one of them, going into bankruptcy, entering into a composition or arrangement with creditors, or, in the case of them being in a partnership, dissolving the partnership.

4.3.6 Where the operator proposes to make a change in the nature or functioning, or an extension of the activities, which may have consequences for the environment and the change is not otherwise the subject of an application for approval under the Regulations or this permit:

(a) the Environment Agency shall be notified at least 14 days before making the change; and

(b) the notification shall contain a description of the proposed change in operation.

4.3.7 The Environment Agency shall be given at least 14 days' notice before implementation of any part of the site closure plan.

4.3.8 The operator shall notify the Environment Agency as soon as is practicable, in writing of any change of medium combustion plant.

4.4 Interpretation

4.4.1 In this permit the expressions listed in schedule 6 shall have the meaning given in that schedule.

4.4.2 In this permit references to reports and notifications mean written reports and notifications, except where reference is made to notification being made "immediately", in which case it may be provided by telephone.

Schedule 1 – Operations

Table S1.1 activities			
Activity reference	**Activity listed in Schedule 1 of the EP Regulations**	**Description of specified activity and WFD Annex I and II operations**	**Limits of specified activity and waste types**
AR1	S5.4 A(1) (b) (i) Recovery or a mix of recovery and disposal of non-hazardous waste with a capacity exceeding 75 tonnes per day (or 100 tonnes per day if the only waste treatment activity is anaerobic digestion) involving biological treatment	R3: Recycling/reclamation of organic substances which are not used as solvents	From receipt of waste through to digestion and recovery of by-products (waste treated by anaerobic digestion). Anaerobic digestion of waste in four tanks followed by burning of biogas produced from the process. Anaerobic digestion shall be limited to 1,178 m^3/day. Waste types suitable for acceptance are limited to those specified in Table S2.2.
Directly Associated Activity			
AR2	Storage of waste pending recovery or disposal	R13: Storage of waste pending the operations numbered R1 and R3 (excluding temporary storage, pending collection, on the site where it is produced)	From the receipt of permitted waste to pre-treatment and despatch for anaerobic digestion on site. Storage of residual wastes from pre-treatment to despatch off-site for recovery. Storage of waste in enclosed equipment and tanks or an enclosed building fitted with appropriate odour abatement and on an impermeable surface with a sealed drainage system. Waste types suitable for acceptance are limited to those specified in Table S2.2.
AR3	Physical treatment for the purpose of recycling	R3: Recycling/reclamation of organic substances which are not used as solvents	From the receipt of waste to despatch for anaerobic digestion or despatch off site for recovery. Dilution of incoming wastes using final waste waters from the wastewater treatment works to aid pre-treatment and digestion only. Pre-treatment of waste in enclosed equipment and tanks or an enclosed building fitted with appropriate odour abatement and on an impermeable surface with a sealed drainage system, including shredding, sorting, screening, compaction, baling, mixing and maceration. Post-treatment of digestate in enclosed equipment and tanks or an enclosed building fitted with appropriate odour abatement and on an impermeable surface with a sealed drainage system, including separation, screening to remove contraries, centrifuge or pressing and addition of

Table S1.1 activities			
Activity reference	**Activity listed in Schedule 1 of the EP Regulations**	**Description of specified activity and WFD Annex I and II operations**	**Limits of specified activity and waste types**
			thickening agents (polymers) or drying for use as a fertiliser or soil conditioner (drying for the purpose of use as a fuel is not permitted). Heat treatment (thermal hydrolysis) of waste in six reactor vessels for the purpose of recovery. Tanks are comprised of two THP feed silos, one THP feed hopper and six THP reactor vessels. Gas cleaning by biological or physical (carbon filtration) or chemical scrubbing. Waste types suitable for acceptance are limited to those specified in Table S2.2.
AR4	Steam and electrical power supply	R1: Use principally as a fuel to generate energy	From the receipt of biogas produced at the on-site anaerobic digestion process to combustion with the release of combustion gases. Combustion of biogas in three combined heat and power (CHP) engines with thermal inputs of 3.63 MWth, 3.63 MWth and 1.53 MWth. Combustion of natural gas in one CHP engine with a thermal input of 1.53 MWth. Combustion of biogas and natural gas in two auxiliary boilers with a thermal input of 6.2 MWth each.
AR5	Emergency flare operation	D10: Incineration on land	From the receipt of biogas produced at the on-site anaerobic digestion process to incineration with the release of combustion gases. There shall be no venting or flaring of gas for disposal. Use of one auxiliary flare required only during periods of breakdown or maintenance of the CHP engines and/or auxiliary boilers.
AR6	Raw material storage	Storage of raw materials including lubrication oil, antifreeze, propane, ferric chloride, activated carbon, diesel.	From the receipt of raw materials to despatch for use within the facility.

AR7	Gas storage	R13: Storage of waste pending any of the operations numbered R1 to R12 (excluding temporary storage, pending collection, on the site where it is produced)	Storage of biogas produced from on-site anaerobic digestion of permitted waste in two stand-alone biogas holders or roof space of digesters. From the receipt of biogas produced at the on-site anaerobic digestion process to despatch for use within the facility. Emissions of unburnt biogas shall be minimised.
AR8	Digestate storage	R13: Storage of waste pending any of the operations numbered R1 to R12 (excluding temporary storage, pending collection, on the site where it is produced)	From the receipt of processed digestate produced from the on-site anaerobic digestion process to despatch for use off-site. Storage of processed liquid digestate in two degassing tanks, two conditioning dewatering feed tanks and two export dewatering feed tanks. Storage of processed solid digestate in one cake pad and one open sided cake barn building and on an impermeable surface with sealed drainage system.
AR9	Surface water collection and storage	Collection and storage of uncontaminated roof and site surface water	From the collection of uncontaminated roof and site surface water from non-operational areas only to re-use within the facility or discharge off-site.
AR10	Air abatement	Collection and treatment of air from the buildings or plant using abatement system – 7 x carbon filters prior to release to atmosphere.	From the collection of air from site processes to treatment and release of treated air to atmosphere. Collection and treatment of air from the buildings, tanks or plant using abatement system – [7 x carbon filters].

Table S1.2 Operating techniques		
Description	**Parts**	**Date Received**
Application EPR/VP3130GZ/V005	Response to section 3a – technical standards, Part C3 of the application form. BAT Gap Analysis received 20/01/2023 showing Best available techniques as described in the BAT Reference Document for Waste Treatment (the BREF) and BAT conclusions. Esholt Sludge Treatment Facility Environmental Permit Site Condition Report received 20/01/2023, Final Version, January 2023. Appendix 14 supporting information, Esholt Leak Detection and Repair Plan (LDAR) Version 1, 20/01/2023. ADBA assessment received 20/01/2023. Non duly making response for further information, including: Esholt STF Bioaerosols Risk Assessment Version V001 October 2024, detailing bioaerosol monitoring. Esholt Sludge Treatment Facility Accident Management Plan, V001 21/10/2024.	22/10/2024
Response to Schedule 5 Notice dated 08/11/2024	Response to schedule 5 notice including: Pressure relief valve information on how installed and managed, including national grid references (NGR) for locations. Revised Figure 3 principal emissions point site plan.	05/12/2024
Response to Schedule 5 Notice dated 08/11/2024	Response to schedule 5 notice including: Revised Esholt Sludge Treatment Facility Odour Management Plan, V004, December 2024 [excluding sniff test frequency specified in section 5.1 – For Environment Agency approved sniff test frequency refer to the process monitoring table S3.4]. Revised secondary containment document reference “Esholt Secondary Containment Assessment”, Version V004, dated December 2024. Revised permit application main text, supporting information Section II and technical description. Revised Esholt process flow diagram, V11. Revised Appendix 12 Medium Combustion Plant Directive Requirements.	11/12/2024
Response to Schedule 5 Notice dated 08/11/2024	Response to schedule 5 notice including: Revised Figure 2 site layout plan.	16/12/2024

Table S1.3 Improvement programme requirements		
Reference	**Requirement**	**Date**
Improvement conditions from EPR/VP3130GZ/V004		
IC1	The Operator shall notify the Environment Agency in writing of the date of completion of the relocation of existing CHP engines. Within 14 days following the end of relocation.	Completed 13/08/2023
IC2	The Operator shall notify the Environment Agency in writing of the date of commencement of commissioning of the new CHP engines. At least 14 days before commissioning begins.	Completed 05/08/2013
Improvement condition for secondary containment design		
IC3	The operator shall submit a written 'secondary containment implementation plan' and shall obtain the Environment Agency's written approval to it. The plan shall contain the finalised designs and an implementation schedule for the identified secondary containment systems proposed in the document "Esholt Secondary Containment Assessment", Version 4, dated December 2024. The finalised design(s) and specifications shall be produced by appropriate competent individuals (qualified civil or structural engineer), in accordance with the risk assessment methodology detailed within CIRIA C736 (2014) guidance. The plan shall include but not be limited to the following components: • An updated BAT assessment with specific regard to BAT 19 of the Waste Treatment BREF to demonstrate how the finalised designs based on the proposed secondary containment in the document "Esholt Secondary Containment Assessment", Version 4, dated December 2024 meets BAT 19. • An assessment of the suitability for providing containment when subjected to the dynamic and static loads caused by catastrophic tank failure. • Finalised designs and specifications of the proposed secondary containment proposal completed by appropriate competent individuals. • A program of works with timescales for the commissioning of the secondary containment systems to comply with CIRIA C736 (2014) guidance, or equivalent. • An updated site and infrastructure plan. • A preventative maintenance and inspection regime. The plan shall be implemented in accordance with the Environment Agency's prior written approval.	31/03/2025 Implementation of all required and approved containment improvements must be completed by 31/03/2025
Improvement condition to address the reinstatement of odour control units – emission points A10, A11 and A12		
IC4	The operator shall submit written evidence to the environment agency to demonstrate that the odour control units identified as emission points A10 (serving the sludge screen feed tank), A11 (serving the two mixed sludge tanks and two SAS transfer tanks) and A12 (serving the two THP feed silos, THP hopper and dewatering centrifuge pumping station) have been reinstated, and that they are fully operational. This evidence shall include recommissioning and testing data, and a full explanation of works carried out.	Within 6 months of permit issue or such other date as agreed in writing with the Environment Agency

Table S1.3 Improvement programme requirements		
Reference	**Requirement**	**Date**
Improvement condition for enclosure of tanks storing (or treating) sewage sludge (tanks pre-digestion)		
IC5	The operator shall submit a written 'enclosure and abatement plan' and obtain the Environment Agency's written approval to it. The plan shall contain the final designs and an implementation schedule for the installation of enclosures/covers and associated emission abatement systems in line with BAT 14 and BAT 53 for storage and treatment tanks pre-anaerobic digestion identified as screen sludge transfer pumping station, consolidation tank 5, cake import reception unit, thickener liquor sump and proposed OCUs at emission points A15, A16 and A17. The plan shall include evidence that the tank enclosures/covers will be designed and installed in accordance with guidance, *Biological waste treatment: appropriate measures for permitted facilities*, and provide evidence to demonstrate why the emission abatement system will be effective and meet the requirements of BAT 14 and BAT 53. The plan shall be implemented in accordance with the Environment Agency's prior written approval. (Note that approval of reports under this improvement condition does not preclude the need for permit variation applications to implement the improvements identified in the report. Any variation may include the insertion of necessary emission limit values).	31/03/2025 Implementation of all required vessel cover improvements must be completed by 31/03/2025
Improvement conditions for enclosure of tanks storing (or treating) digestate		
IC6	The operator shall submit a written 'post anaerobic digestion vessel cover' plan and obtain the Environment Agency's written approval to it. The plan shall contain the final designs and an implementation schedule for the installation of covers for vessels storing and/or treating digestate in tanks identified as the two degassing tanks, two export dewatering feed tanks, two conditioning dewatering feed tanks and the two liquor/centrate balancing tanks. The plan shall also contain a detailed description of the proposed gas utilisation/abatement plant, gas storage infrastructure for the biogas produced during anaerobic digestion, pressure relief valves and gas pipework. The plan shall include but not be limited to the following components: • Evidence that the pollutants of the waste gas (including methane) produced in tanks as the two degassing tanks, two export dewatering, two conditioning dewatering feed tanks and the two liquor/centrate balancing tanks will be controlled and/or abated either by the proposed gas utilisation plant or proposed abatement system. • Evidence that the vessel covers, gas utilisation/ abatement plant and ancillary equipment have been designed by appropriately qualified engineers. • Evidence that the vessel covers, and gas utilisation/abatement plant will be designed and installed in accordance with guidance, *Biological waste treatment: appropriate measures for permitted facilities*.	31/03/2025 Implementation of all required vessel cover improvements must be completed by 31/03/2025

Table S1.3 Improvement programme requirements		
Reference	**Requirement**	**Date**
	• An updated Hazard and Operability Study (HAZOP) and DSEAR risk assessment. • An assessment of gas storage capacity and gas utilisation/abatement capacity including proposals for additional gas utilisation/ abatement plant. • A program of works with timescales for the commissioning of the vessel cover(s), gas utilisation/ abatement infrastructure and ancillary equipment. The plan shall be implemented in accordance with the Environment Agency's prior written approval. (Note that approval of reports under this improvement condition does not preclude the need for permit variation applications to implement the improvements identified in the report. Any variation may include the insertion of necessary emission limit values).	
Improvement conditions for primary containment tanks		
IC7	The operator shall submit a written 'primary containment plan' and shall obtain the Environment Agency's written approval to it. The plan shall contain the results of an inspection and program of works undertaken by an appropriately qualified engineer and shall assess the extent, design specification and condition of primary containment systems (including associated pipework) where polluting liquids and solids are being stored, treated, and/or handled. The plan shall include, but not be limited to: • An assessment of the physical condition of all primary containment systems (storage and treatment vessels and associated pipework) using a Written Scheme of Examination and their suitability for providing primary containment when subjected to dynamic and static loads. • A program of works with timescales for the implementation of individual improvement measures necessary to demonstrate that the primary containment is fit for purpose or alternative appropriate measures to ensure all polluting materials will be contained on site. • A preventative maintenance and inspection regime. The plan shall be implemented in accordance with the Environment Agency's written approval.	Within 12 months of permit issue or such other date as agreed in writing with the Environment Agency
Improvement conditions for establishing an inventory of liquid waste water discharged from anaerobic digestion and associated activities		
IC8a	The operator shall submit a sampling programme in relation to waste water streams and shall obtain the Environment Agency's written approval to it. The sampling programme shall be designed to fully characterise the waste waters discharged to Esholt wastewater treatment works (WwTW) from emission points S1, S2 and S3 in (table S3.3 of this permit). The programme shall include but not be limited to a methodology for a minimum of one 24-hour flow proportional sample a month, for each emission point, for a period of 12 months. The programme shall detail the sampling methods/standards used. Sampling methods shall be in	Within 2 months of issue of this permit or such other date as agreed in writing with the Environment Agency

Table S1.3 Improvement programme requirements		
Reference	**Requirement**	**Date**
	accordance with BAT conclusion 20 of the Waste Treatment BREF. The programme shall include the National Grid Reference (NGR) of the sampling point locations. The programme shall establish the characteristics of the liquid waste water streams and shall include as a minimum for each emission point: • Average values and variability of flow, pH, temperature and conductivity. • Average concentration and load values of all relevant substances and their variability. • Data on bioeliminability. The programme shall sample for all relevant substances and must include: • Hydrocarbon oil index (HOI) (mg/l) • Free cyanide (CN^-) (mg/l) • Adsorbable organically bound halogens (AOX) (mg/l) • Metals and metalloids; arsenic (expressed as As), cadmium (expressed as Cd), chromium (expressed as Cr), hexavalent chromium (expressed as Cr(VI)), copper (expressed as Cu), lead (expressed as Pb), nickel (expressed as Ni), mercury (expressed as Hg), zinc (expressed as Zn) (µg/l) The operator shall submit the collected monitoring data in writing to the Environment Agency according to agreed reporting periods. The sampling programme shall be produced in accordance with Environment Agency guidance: • Specific substances and priority hazardous substances – *Surface water pollution risk for your environmental permit* Surface water pollution risk assessment for your environmental permit - GOV.UK (www.gov.uk). • *Monitoring discharges to water: guidance on selecting a monitoring approach* Monitoring discharges to water: guidance on selecting a monitoring approach - GOV.UK (www.gov.uk) The monitoring programme shall be carried out and the monitoring data submitted in accordance with the Environment Agency's written approval.	
Improvement conditions for indirect discharges to water discharged from anaerobic digestion and associated activities		
IC8b	The operator shall submit a report for approval by the Environment Agency, following completion of the sampling programme approved under IC8a. The report shall include but not be limited to; a summary of the sample results, a completed H1 risk assessment(s) and modelling outputs where appropriate. The operator shall provide conclusions on whether the waste waters discharged from S1, S2 and S3 will have any adverse impact on the receiving waters once discharged from Esholt WwTW. An assessment shall be made against the parameters specified in the relevant	Within 15 months of the Environment Agency's written approval of the sampling programme submitted under IC8a or such other

Table S1.3 Improvement programme requirements		
Reference	**Requirement**	**Date**
	environmental standards as specified within Environment Agency guidance as follows: • Specific substances and priority hazardous substances – *Surface water pollution risk for your environmental permit* Surface water pollution risk assessment for your environmental permit - GOV.UK (www.gov.uk). • Sanitary substances – *H1 annex D2: assessment of sanitary and other pollutants in surface water discharges* 1076_14 H1 Annex D2 - Assessment of sanitary and other pollutants within Surface Water Discharges (publishing.service.gov.uk) The report shall include any proposals and/or additional measures required to prevent or minimise any significant emissions from the installation along with timescales for implementation.	date as agreed in writing with the Environment Agency
IC8c	The operator shall implement any improvements identified within the report approved under IC8b in accordance with the Environment Agency's written approval and provide written confirmation to the Environment Agency that the improvements have been completed. (Note, approval of reports under this improvement condition does not preclude the need for permit variation application(s) to operate the improvements identified in the report and/or include any necessary emission limit values).	Within 6 months of the report in relation to IC8b being approved by the Environment Agency or such other date as agreed in writing with the Environment Agency
Improvement condition to address methane slip emissions from gas engines burning biogas		
IC9	The operator shall submit a written plan for approval by the Environment Agency which establishes the methane emissions in the exhaust gas from engines burning biogas and or biomethane and compare these to the manufacturer's specification and benchmark levels. The plan shall develop proposals to assess the potential for methane slip and take corrective actions where emissions of methane above the manufacturer's specification are identified. The operator shall establish methane emissions in the exhaust gas and methane slip using the following standards: • EN ISO 25139 • EN ISO 25140	Within 6 months of permit issue or as such other agreed in writing with the Environment Agency
Improvement condition for the abatement of dispersion stack		
IC10	The operator shall submit a written 'abatement plan' and obtain the Environment Agency's written approval to it. The plan shall contain the final designs and an implementation schedule for the installation of gas utilisation/abatement plant, gas storage infrastructure for any biogas produced, pressure relief valves and gas pipework at emission point A14 (serving the two degassing tanks) that meets the	Within 6 months of permit issue or such other date as agreed in writing with

Table S1.3 Improvement programme requirements		
Reference	**Requirement**	**Date**
	requirements of BAT 14 and BAT 34 of the Waste Treatment BREF. That plan shall also contain but not be limited to: • Evidence that the pollutants of the waste gas (including methane) produced in the two degassing tanks will be controlled and/or abated either by the proposed gas utilisation plant or proposed abatement system. • Evidence that the gas utilisation/ abatement plant and ancillary equipment have been designed by appropriately qualified engineers. • If abatement is proposed the plan shall include a demonstration (whether by a detailed review of technical papers or by trial results) that all odorous chemical compounds and their loading rates expected in the relevant air streams have been considered in the design; and supporting evidence that the odorous compounds will be controlled and/or abated either by operating techniques or by the proposed abatement systems. • If gas utilisation is proposed an assessment of gas storage capacity and gas utilisation/abatement capacity including proposals for additional gas utilisation/ abatement plant. • Evidence that the gas utilisation/abatement plant will be designed and installed in accordance with guidance, *Biological waste treatment: appropriate measures for permitted facilities.* • A program of works with timescales for the commissioning of the abatement plant infrastructure. The operator shall install and commission the abatement plant in line with the timescales as approved by the Environment Agency. (Note that approval of reports under this improvement condition does not preclude the need for permit variation applications to implement the improvements identified in the report. Any variation may include the insertion of necessary emission limit values).	the Environment Agency
Improvement condition for review of effectiveness of abatement plant		
IC11	The operator shall carry out a review of the onsite abatement plant identified as: • OCU 1 at emission point A10 serving the sludge screen feed tank • OCU 2 at emission point A11 serving the two mixed sludge tanks and two SAS transfer tanks • OCU 3 at emission point A12 serving the two THP feed silos, THP hopper and dewatering centrifuge pumping station • OCU 4 at emission point A13 serving the four drum thickeners and thickener liquor sump • OCU 5 at emission point A15 serving the screen sludge transfer pumping station • OCU 6 at emission point A16 serving the cake import reception unit; and • OCU 7 at emission point A17 serving the consolidation tank 5)	For A10, A11, A12, A15, A16 & A17: 6 months from completion of IC4 and IC5 or such other date as agreed in writing with the Environment Agency

Table S1.3 Improvement programme requirements		
Reference	**Requirement**	**Date**
	This will determine whether the measures have been effective and adequate to prevent, or where this is not possible to minimise, emissions released to air (including but not limited to odour, ammonia, Hydrogen chloride (HCl) and TVOC). The operator shall submit a written report to the Environment Agency following this review for assessment and approval. The report shall include but not be limited to the following aspects: • Full investigation and characterisation of the waste gas streams. • Evidence that the emission of pollutants in the waste gas stream is being prevented or where this is not possible minimised by the abatement plant. • Abatement stack monitoring results (including but not limited to odour, ammonia, HCl and TVOC). • Abatement process monitoring results (including but not limited to odour, ammonia, HCl and TVOC). • Details of air quality quantitative impact assessment including modelling and a proposal for site-specific "action levels" (including but not limited to odour concentration, hydrogen sulphide, ammonia, HCl and TVOC). • Odour monitoring results at the site boundary. • Records of odour complaints and odour related incidents. • Recommendations for improvement including the replacement or upgrading of the abatement plant. • Timescales for implementation of improvements to the abatement plant. The operator shall implement any improvements in line with the timescales as approved by the Environment Agency. (Note that approval of reports under this improvement condition does not preclude the need for permit variation applications to implement the improvements identified in the report. Any variation may include the insertion of necessary emission limit values).	For A13: 6 months from permit issue or such other date as agreed in writing with the Environment Agency
Improvement condition for monitoring digestate stability		
IC12	The operator shall submit a written report, with supporting evidence, on the stability of whole digestate, (i.e. prior to dewatering), and obtain the Environment Agency's written approval to it. The report shall assess whether biogas emissions from post digestion storage or treatment of digestate is likely to have been minimised. The report shall include but not be limited to: • An assessment of residual biogas potential in accordance with the OFW004-005 [N6] methodology specified by *BSI PAS 110: Producing Quality Anaerobic Digestate* or an equivalent methodology for assessing residual biogas potential of the digestate.	Within 6 months of permit issue or such other date as agreed in writing with the Environment Agency

Schedule 2 – Waste types, raw materials and fuels

Table S2.1 Raw materials and fuels	
Raw materials and fuel description	**Specification**
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Table S2.2 Permitted waste types and quantities for anaerobic digestion	
Maximum quantity	**Annual throughput shall not exceed 2,250,825 tonnes**
Exclusions	Wastes having any of the following characteristics shall not be accepted: • Biodegradable wastes that is significantly contaminated with non-compostable or digestible contaminants, in particular plastic and litter shall be no more than 5% w/w and shall be as low as reasonably practicable by 31 December 2025. • Wastes containing wood-preserving agents or other biocides and post-consumer wood. • Wastes containing persistent organic pollutants. • Wastes containing Japanese Knotweed or other invasive plant species listed in the Invasive Species (Amendment etc.) (EU Exit) Regulations 2019. • Manures, slurries and spoiled bedding and straw from farms where animals have notifiable diseases as stipulated in the Animal By-Products (Enforcement) (England) Regulations 2013. • Pest infested waste.
Waste code	**Description**
19	**Wastes from waste management facilities, off-site waste water treatment plants and the preparation of water intended for human consumption and water for industrial use**
19 02	**wastes from physico/chemical treatments of waste (including dechromatation, decyanidation, neutralisation)**
19 02 06	sludges from physico/chemical treatment other than those mentioned in 19 02 05 (sewage sludge only)
19 06	**wastes from anaerobic treatment of waste**
19 06 06	digestate from anaerobic treatment of animal and vegetable waste (digested sewage sludge only)
19 08	**wastes from waste water treatment plants not otherwise specified**
19 08 05	sludges from the treatment of urban waste water

Schedule 3 – Emissions and monitoring

Table S3.1 Point source emissions to air – emission limits and monitoring requirements						
Emission point ref. & location	**Source**	**Parameter**	**Limit (including unit)**	**Reference period**	**Monitoring frequency**	**Monitoring standard or method**
Existing medium combustion plant (1 MW to 5 MW)						
Point A1 on site plan in Schedule 7 NGR: SE 18749 39544	1 x 3.63 MWth CHP engine 3 stack burning biogas [note 1]	Oxides of Nitrogen (NO and NO_2 expressed as NO_2)	500 mg/m^3	Average over sample period	Annual	BS EN 14792
		Sulphur dioxide	350 mg/m^3 [note 2]			BS EN 14791 or CEN TS 17021 or by calculation based on fuel sulphur
		Sulphur dioxide	162 mg/m^3 [note 3]			
		Carbon monoxide	1400 mg/m^3			BS EN 15058
		Total VOCs	No limit set	--	--	BS EN 12619
Point A3 on site plan in Schedule 7 NGR: SE 18749 39544	1 x 3.63 MWth CHP engine 4 stack burning biogas [note 1]	Oxides of Nitrogen (NO and NO_2 expressed as NO_2)	500 mg/m^3	Average over sample period	Annual	BS EN 14792
		Sulphur dioxide	350 mg/m^3 [note 2]			BS EN 14791 or CEN TS 17021 or by calculation based on fuel sulphur
		Sulphur dioxide	162 mg/m^3 [note 3]			
		Carbon monoxide	1400 mg/m^3			BS EN 15058
		Total VOCs	No limit set	--	--	BS EN 12619
Point A5 on site plan in Schedule 7 NGR: SE 18749 39544	1 x 1.53 MWth CHP engine 1 stack burning natural gas [note 1]	Oxides of Nitrogen (NO and NO_2 expressed as NO_2)	500 mg/m^3	Average over sample period	Annual	BS EN 14792
		Carbon monoxide	No limit set	--	--	BS EN 15058

Point A6 on site plan in Schedule 7 NGR: SE 18749 39544	1 x 1.53 MWth CHP engine 2 stack burning biogas [note 1]	Oxides of Nitrogen (NO and NO_2 expressed as NO_2)	500 mg/m^3	Average over sample period	Annual	BS EN 14792
		Sulphur dioxide	350 mg/m^3 [note 2]			BS EN 14791 or CEN TS 17021 or by calculation based on fuel sulphur
		Sulphur dioxide	162 mg/m^3 [note 3]			
		Carbon monoxide	1400 mg/m^3			BS EN 15058
		Total VOCs	No limit set	--	--	BS EN 12619
Existing medium combustion plant other than engines fuelled on biogas (greater than 5 MW)						
Point A2 on site plan in Schedule 7 NGR: SE 18749 39544	1 x 6.2 MWth Boiler 1 stack [burning biogas] [note 1]	Oxides of Nitrogen (NO and NO_2 expressed as NO_2)	250 mg/m^3	Average over sample period	Annual	BS EN 14792
		Sulphur dioxide	170 mg/m^3			BS EN 14791 or CEN TS 17021 or by calculation based on fuel sulphur
Point A4 on site plan in Schedule 7 NGR: SE 18749 39544	1 x 6.2 MWth Boiler 2 stack [burning biogas] [note 1]	Oxides of Nitrogen (NO and NO_2 expressed as NO_2)	250 mg/m^3	Average over sample period	Annual	BS EN 14792
		Sulphur dioxide	170 mg/m^3			BS EN 14791 or CEN TS 17021 or by calculation based on fuel sulphur

Existing medium combustion plant other than engines and gas turbines fuelled on natural gas (greater than 5 MW)						
Point A2 on site plan in Schedule 7 NGR: SE 18749 39544	1 x 6.2 MWth boiler 1 stack [burning natural gas] [note 1]	Oxides of Nitrogen (NO and NO_2 expressed as NO_2)	200 mg/m^3	Average over sample period	Annual	BS EN 14792
		Carbon monoxide	No limit set			BS EN 15058
Point A4 on site plan in Schedule 7 NGR: SE 18749 39544	1 x 6.2 MWth boiler 2 stack [burning natural gas] [note 1]	Oxides of Nitrogen (NO and NO_2 expressed as NO_2)	200 mg/m^3	Average over sample period	Annual	BS EN 14792
		Carbon monoxide	No limit set			BS EN 15058
Point A7 on site plan in schedule 7 NGR: SE 18536 39417	Emergency flare stack [note 1]	Oxides of Nitrogen (NO and NO_2 expressed as NO_2)	150 mg/m^3	Average over sample period	[note 4]	BS EN 14792
		Carbon monoxide	50 mg/m^3			BS EN 15058
		Total VOCs	10 mg/m^3			BS EN 12619
Point A10 on site plan in schedule 7 NGR: SE 18579 39515	Channelled emissions from carbon filter within odour control unit stack (OCU 1) [note 6]	Hydrogen sulphide	No limit set	Average over sample period	Once every 6 months	CEN TS 13649 for sampling NIOSH 6013 for analysis
		Ammonia	20 mg/m^3			EN ISO 21877
		Odour concentration	No limit set	--		BS EN 13725
	Channelled emissions to air from treatment of water-based liquid waste	Hydrogen chloride (HCl)	5 mg/m^3 [note 5]	Average over sample period		EN 1911
		TVOC	20 mg/m^3 [note 5]			EN 12619
Point A11 on site plan in schedule 7 NGR: SE 18619 39484	Channelled emissions from carbon filter within odour control unit stack (OCU 2) [note 6]	Hydrogen sulphide	No limit set	Average over sample period	Once every 6 months	CEN TS 13649 for sampling NIOSH 6013 for analysis
		Ammonia	20 mg/m^3			EN ISO 21877
		Odour concentration	No limit set	--		BS EN 13725

	Channelled emissions to air from treatment of water-based liquid waste	Hydrogen chloride (HCl)	5 mg/m^3 [note 5]	Average over sample period		EN 1911
		TVOC	20 mg/m^3 [note 5]			EN 12619
Point A12 on site plan in schedule 7 NGR: SE 18708 39501	Channelled emissions from carbon filter within odour control unit stack (OCU 3) [note 6]	Hydrogen sulphide	No limit set	Average over sample period	Once every 6 months	CEN TS 13649 for sampling NIOSH 6013 for analysis
		Ammonia	20 mg/m^3			EN ISO 21877
		Odour concentration	No limit set	--		BS EN 13725
	Channelled emissions to air from treatment of water-based liquid waste	Hydrogen chloride (HCl)	5 mg/m^3 [note 5]	Average over sample period		EN 1911
		TVOC	20 mg/m^3 [note 5]			EN 12619
Point A13 on site plan in schedule 7 NGR: SE 18537 39347	Channelled emissions from carbon filter within odour control unit stack (OCU 4) [note 6]	Hydrogen sulphide	No limit set	Average over sample period	Once every 6 months	CEN TS 13649 for sampling NIOSH 6013 for analysis
		Ammonia	20 mg/m^3			EN ISO 21877
		Odour concentration	No limit set	--		BS EN 13725
	Channelled emissions to air from treatment of water-based liquid waste	Hydrogen chloride (HCl)	5 mg/m^3 [note 5]	Average over sample period		EN 1911
		TVOC	20 mg/m^3 [note 5]			EN 12619
Point A15 on site plan in schedule 7 NGR: SE 18629 39510	Channelled emissions from carbon filter within odour control unit stack (OCU 5) [note 6]	Hydrogen sulphide	No limit set	Average over sample period	Once every 6 months	CEN TS 13649 for sampling NIOSH 6013 for analysis
		Ammonia	20 mg/m^3			EN ISO 21877
		Odour concentration	1,000 ou_E/m^3 [note 7]			BS EN 13725
	Channelled emissions to air from treatment of water-based liquid waste	Hydrogen chloride (HCl)	5 mg/m^3 [note 5]			EN 1911
		TVOC	20 mg/m^3 [note 5]			EN 12619

Point A16 on site plan in schedule 7 NGR: SE 18760 39490	Channelled emissions from carbon filter within odour control unit stack (OCU 6) [note 6]	Hydrogen sulphide	No limit set	Average over sample period	Once every 6 months	CEN TS 13649 for sampling NIOSH 6013 for analysis
		Ammonia	20 mg/m^3			EN ISO 21877
		Odour concentration	1,000 ou_E/m^3 [note 7]			BS EN 13725
	Channelled emissions to air from treatment of water-based liquid waste	Hydrogen chloride (HCl)	5 mg/m^3 [note 5]			EN 1911
		TVOC	20 mg/m^3 [note 5]			EN 12619
Point A17 on site plan in schedule 7 NGR: SE 18703 39426	Channelled emissions from carbon filter within odour control unit stack (OCU 7) [note 6]	Hydrogen sulphide	No limit set	Average over sample period	Once every 6 months	CEN TS 13649 for sampling NIOSH 6013 for analysis
		Ammonia	20 mg/m^3			EN ISO 21877
		Odour concentration	1,000 ou_E/m^3 [note 7]			BS EN 13725
	Channelled emissions to air from treatment of water-based liquid waste	Hydrogen chloride (HCl)	5 mg/m^3 [note 5]			EN 1911
		TVOC	20 mg/m^3 [note 5]			EN 12619
Point A8 and A9 Pressure relief valves NGRs: SE 18561 39440 and SE 18572 39445	Gas storage holders	Biogas release and operational events	No limit set	Recorded duration and frequency	Daily inspection	--
Point A18, A19, A20 and A21 Pressure relief valves NGRs: SE 18639 39419, SE 18613 39402, SE 18595 39383 and SE 18597 39432	Digesters	Biogas release and operational events	No limit set	Recorded duration and frequency	Daily inspection	--

Point A22a, A22b, A22c, A22d, A22e, A22f, A22g, A22h, A22i & A22j Pressure relief valves	THP	Biogas release and operational events	No limit set	Recorded duration and frequency	Daily inspection	--
Vents from tank(s)	Oil/Fuel Storage tank(s)	No parameter set	No limit set	--	--	--

Note 1 – These emission limits are based on normal operating conditions and load - temperature 0°C (273 K); pressure 101.3 kPa and oxygen 5% (for gas engines burning biogas and natural gas) and oxygen 3% (for emergency flares and medium combustion plants other than engines and gas turbines burning biogas such as boilers).

Note 2 – This emission limit applies until 31 December 2029, unless the gas engine is replaced.

Note 3 – This emission limit applies from 1 January 2030, unless otherwise advised by the Environment Agency.

Note 4 – Monitoring to be undertaken in the event the emergency flare has been operational for more than 10 per cent of a year (876 hours). Record of operating hours to be submitted annually to the Environment Agency.

Note 5 – Monitoring and limits only apply where the substance concerned is identified as relevant in the waste gas inventory IC11.

Note 6 – The monitoring of NH_3 and H_2S can be used as an alternative to the monitoring of the odour concentration subject to the outcome of IC11.

Note 7 – This emission limit applies upon the completion of IC4, IC5 and IC11.

Table S3.2 Point source emissions to water (other than sewer) and land – emission limits and monitoring requirements						
Emission point ref. & location	**Source** [Note 1]	**Parameter**	**Limit (incl. unit)**	**Reference Period**	**Monitoring frequency**	**Monitoring standard or method**
W1 on site plan in schedule 7 emission to soakaway	Uncontaminated site surface water from roofs and non-operational areas	Oil and grease	No visible oil or grease	--	Weekly	Visual assessment
W2 on site plan in schedule 7 emission to soakaway	Uncontaminated site surface water from roofs and non-operational areas	Oil and grease	No visible oil or grease	--	Weekly	Visual assessment
W3 on site plan in schedule 7 emission to soakaway	Uncontaminated site surface water from roofs and non-operational areas	Oil and grease	No visible oil or grease	--	Weekly	Visual assessment
Note 1 – Clean surface water from roofs, or from areas of the site that are not being used in connection with storing and treating waste can be discharged directly to surface waters, or to groundwater by seepage through the soil via a soakaway.						

Table S3.3 Point source emissions to sewer, effluent treatment plant or other transfers off-site – emission limits and monitoring requirements						
Emission point ref. & location	**Source**	**Parameter [Note 1]**	**Limit (incl. unit) [Note 1]**	**Reference Period**	**Monitoring frequency [Note 2]**	**Monitoring standard or method**
S1, S2 and S3 on site plan in schedule 7 emission to River Aire via Esholt WwTW	Site surface water in operational areas, cleaning wash waters and effluent, boiler blowdown, biogas condensate, cooling water and waste waters arising from sludge treatment operations including liquors from the drum thickeners and dewatering centrifuges	Oil and grease	No visible oil or grease	--	Weekly	Visual assessment
		Benzene, toluene, ethylbenzene, xylene (BTEX)	--	Spot sample or flow-proportional composite sample	Once every month	EN ISO 15680
		Hydrocarbon oil index (HOI)	10 mg/l		Once every day	EN ISO 9377-2
		Free cyanide (CN^-)	0.1 mg/l			EN ISO 14403-1 or EN ISO 14403-2
		Adsorbable organically bound halogens (AOX)	1 mg/l			EN ISO 9562
		Arsenic (As)	0.1 mg/l			

Table S3.3 Point source emissions to sewer, effluent treatment plant or other transfers off-site – emission limits and monitoring requirements						
Emission point ref. & location	**Source**	**Parameter [Note 1]**	**Limit (incl. unit) [Note 1]**	**Reference Period**	**Monitoring frequency [Note 2]**	**Monitoring standard or method**
		Cadmium (Cd)	0.1 mg/l	Spot sample or flow-proportional composite sample	Once every day	EN ISO 11885, EN ISO 17294-2 or EN ISO 15586
		Chromium (Cr)	0.3 mg/l			
		Copper (Cu)	0.5 mg/l			
		Lead (Pb)	0.3 mg/l			
		Nickel (Ni)	1 mg/l			
		Zinc (Zn)	2 mg/l			
		Mercury (Hg)	10 µg/l	Spot sample or flow-proportional composite sample	Once every day	EN ISO 17852 or EN ISO 12846
		Manganese (Mn)	--			EN ISO 11885, EN ISO 17294-2 or EN ISO 15586
		Hexavalent chromium (Cr(VI))	0.1 mg/l			EN ISO 10304-3 or EN ISO 23913
		PFOA and PFOS	--		Once every six months	--
Note 1 – Monitoring and limits only apply where the substance concerned is identified as relevant in the waste water inventory as determined by improvement condition IC8a and IC8b. Note 2 – Monitoring frequency as specified unless the Environment Agency has agreed in writing other alternative appropriate monitoring frequencies.						

Table S3.4a Process monitoring requirements				
Emission point reference or source or description of point of measurement	**Parameter**	**Monitoring frequency**	**Monitoring standard or method**	**Other specifications**
Digester feed (digestion process)	pH	As described in site operating techniques	As described in site operating techniques	Process monitoring to be recorded using a SCADA system where relevant.
	Alkalinity			
	Temperature			
	Hydraulic loading rate			
	Organic loading rate			
	Volatile fatty acids concentration			
	Ammonia			
	Liquid /foam level			
Biogas in digesters & biogas storage holders	Flow	Continuous	In accordance with EU weights and measures Regulations	Process monitoring to be recorded using a SCADA system where relevant. Gas monitors to be calibrated every 6 months or in accordance with the manufacturer's recommendations.
	Methane	Continuous	None specified	
	CO_2	Continuous	None specified	
	O_2	Continuous	None specified	
	Hydrogen sulphide	Daily	None specified	
	Pressure	Continuous	None specified	
Digestate batch	Volatile fatty acids concentration	One sample at the end of each batch (hydraulic retention time) cycle.	As described in site operating techniques	--
	Ammonia			
Digesters and storage tanks	Integrity checks	Weekly	Visual assessment	In accordance with design specification and tank integrity checks.
Digesters	Agitation /mixing	Continuous	Systems controls	Records maintained in daily operational records.
	Tank capacity and sediment assessment	Once every 5 years from date of commission	Non-destructive pressure testing integrity assessment every 5 years or as specified	In accordance with design specification and tank integrity checks.

Table S3.4a Process monitoring requirements				
Emission point reference or source or description of point of measurement	**Parameter**	**Monitoring frequency**	**Monitoring standard or method**	**Other specifications**
			by manufacturers technical specification.	
Waste reception building or area; Digesters and storage tanks	Odour	Daily	Olfactory monitoring	Odour detection at the site boundary.
Diffuse emissions from all sources identified in the Leak Detection and Repair (LDAR) programme	VOCs including methane	Every 6 months or otherwise agreed in accordance with the LDAR programme	'Sniffing' and/or Optical Gas Imaging techniques in accordance with BS EN 15446 & BS EN 17628	Monitoring points as specified in a DSEAR risk assessment and LDAR programme. Limit as agreed with the Environment Agency as a percentage of the overall gas production.
CHP engine stacks	VOCs including methane	Annually	BS EN 12619	Total annual VOCs emissions from the CHP engine(s) to be calculated and submitted to the Environment Agency.
	Exhaust gas temperature		Traceable to National Standards	--
	Exhaust gas pressure		Traceable to National Standards	--
	Exhaust gas water vapour content		BS EN 14790-1	Unless gas is dried before analysis of emissions.
	Exhaust gas oxygen		BS EN 14789	--
	Exhaust gas flow		BS EN 16911-1	--
Meteorological conditions	Wind speed, air temperature, wind direction	Continuous	Method as specified in management system	Conditions to be recorded in operational diary and records. Equipment shall be calibrated on a 4 monthly basis,

Table S3.4a Process monitoring requirements				
Emission point reference or source or description of point of measurement	**Parameter**	**Monitoring frequency**	**Monitoring standard or method**	**Other specifications**
				in accordance with manufacturer's recommendations or as agreed in writing by the Environment Agency.
Emergency flare	Operating hours	Continuous	Recorded duration and frequency. Recording using a SCADA system or similar system	Date, time and duration of use of auxiliary flare shall be recorded.
	Quantity of gas sent to emergency flare			Quantity can be estimated from gas flow composition, heat content, ratio of assistance, velocity, purge gas flow rate, pollutant emissions.
Pressure relief valves and vacuum systems	Gas pressure	Continuous	Recording using a SCADA system	Continuous gas pressure shall be monitored.
	Re-seating	Weekly inspection	Visual	Operator must ensure that valves are re-seated after release in accordance with the manufacturer's design.
	Inspection, maintenance, calibration, repair and validation	Following foaming or overtopping or at 3 yearly intervals whichever is sooner	Written scheme of examination in accordance with condition 1.1.1	After a foaming event or sticking, build-up of debris, obstructions or damage, operator must ensure that pressure relief valve function remains within designed gas pressure in accordance with the manufacturer's design by suitably trained and qualified personnel.

Table S3.4a Process monitoring requirements				
Emission point reference or source or description of point of measurement	**Parameter**	**Monitoring frequency**	**Monitoring standard or method**	**Other specifications**
	Inspection, calibration and validation report	In accordance with design and construction specifications or after over topping or foaming event	Written scheme of examination in accordance with condition 1.1.1	Operator must ensure that valves are re-seated after release, after a foaming event or sticking, build-up of debris, obstructions or damage. Operator must ensure that PRV function remains within designed operation gas pressure in accordance with the manufacturer's design by suitably trained/qualified personnel. Inspection, calibration and validation report. In accordance with industry Approved Code of Practice
Storage tanks	Volume	Daily	Visual or flow meter measurement	Records of volume must be maintained.

Table S3.4b Process monitoring requirements – odour abatement				
Emission point reference or source or description of point of measurement	**Parameter**	**Monitoring frequency**	**Monitoring standard or method**	**Other specifications**
Odour abatement plant				
Carbon filters				
Carbon filters x 7 (A10, A11, A12, A13, A15, A16 & A17 on site plan in schedule 7)	Carbon bed temperature – inlet and outlet	Continuous	Temperature probe	Odour abatement plant shall be managed in accordance with permit condition 3.3, the odour management plan and manufacturer's recommendations. Carbon filter(s) to be replaced in accordance with manufacturer's recommendations. Equipment shall be calibrated on a 4 monthly basis, or as agreed in writing by the Environment Agency.
	Gas flow rate – inlet and outlet	Continuous	Gas flow meter	
	Moisture or humidity	Daily	Moisture meter	
	Back pressure	Weekly	Recognised industry method	
	Efficiency assessment	Annual	Emission removal efficiency (BS EN 13725 for odour removal)	
	Hydrogen sulphide – inlet and outlet gas stream	Every 6 months or as agreed in writing by the Environment Agency.	CEN TS 13649 for sampling NIOSH 6013 for analysis	Action levels to be agreed on completion of IC11 as approved in writing by the Environment Agency. Action levels to be achieved in accordance with permit condition 3.2 and the odour management plan.
	Ammonia – inlet	Every 6 months or as agreed in writing by the Environment Agency.	EN ISO 21877	Action levels to be agreed on completion of IC11 as approved in writing by the Environment Agency. Action levels to be achieved in accordance with permit condition 3.2 and the odour management plan.
	Odour concentration – inlet and outlet gas stream	Every 6 months or as agreed in writing by the Environment Agency.	BS EN 13725	Action levels to be agreed on completion of IC11 as approved in writing by the Environment Agency. Action levels to be achieved in accordance with permit condition 3.2 and the odour management plan.

Table S3.5 Bioaerosols monitoring requirements – ambient monitoring					
Location or description of point of measurement	**Parameter**	**Bioaerosols action levels (CFU m^{-3})**	**Monitoring frequency**	**Monitoring standard or method**	**Other specifications**
Upwind of the operational area, as described in the Technical Guidance Note M9 Downwind of the operational area, as described in the Technical Guidance Note M9	Total bacteria	1000 Note 1	Quarterly for the first year of operation and twice a year thereafter, unless another frequency is agreed in writing by the Environment Agency Note 2	In accordance with Technical Guidance Note M9 – Environmental monitoring of bioaerosols at regulated facilities.	As described in the Technical Guidance Note M9, including all the additional data requirements specified therein.
	Aspergillus Fumigatus	500 Note 1			
Note 1 – The bioaerosols action levels are only applicable at downwind sampling locations equivalent to the distance of the nearest sensitive receptor. Where these action levels are elevated, the operator must take action to mitigate the impact on sensitive receptors. Assessment of compliance will be based on risk and in line with guidance. Note 2. Where the bioaerosols action levels are exceeded, then monitoring remain quarterly until such time that it is demonstrated that the site has adequate mitigation for a 12 month period.					

Table S3.6 Emissions to sewer, effluent treatment plant or other transfers off-site – Monitoring points			
Effluent(s) and discharge point(s)	**Monitoring type**	**Monitoring point NGR**	**Monitoring point reference**
S1 - Surface water run-off, cleaning effluent/ wash-waters, boiler blowdown and biogas condensate including areas around cake pad/cake barn and run-off from adjacent Biowise composting plant (not part of the installation boundary) to the River Aire via Esholt WwTW shown on site plan in schedule 7	Effluent monitoring	SE 18712 39473	Point S1 (discharge to WwTW) in Schedule 7
S2 - Surface water run-off, cleaning effluent/ wash-waters, thickener liquors/centrate and dewatering liquor (raw sludge) to the River Aire via Esholt WwTW shown on site plan in schedule 7	Effluent monitoring	SE 18603 39372	Point S2 (discharge to WwTW) in Schedule 7
S3 – Surface water run-off, cleaning effluent/ wash-waters and liquor from dewatering (digested sludge) to the River Aire via Esholt WwTW shown on site plan in schedule 7	Effluent monitoring	SE 18857 39189	Point S3 (discharge to WwTW) in Schedule 7

Schedule 4 – Reporting

Parameters, for which reports shall be made, in accordance with conditions of this permit, are listed below.

Table S4.1 Reporting of monitoring data			
Parameter	**Emission or monitoring point/reference**	**Reporting period**	**Period begins**
Emissions to air from CHP engines and boilers Parameters as required by condition 3.5.1.	A1, A2, A3, A4, A5 & A6	Every 12 months	1 January
Emissions to air from odour abatement plant Parameters as required by condition 3.5.1.	A10, A11, A12, A13, A15, A16 & A17	Every 6 months	1 January, 1 July
Emissions to air from abatement systems for waste gas treatment plant Reporting only applies where the substance concerned is identified as relevant in the waste gas inventory IC11 Parameters as required by condition 3.5.1.	A10, A11, A12, A13, A15, A16 & A17	Every 6 months	1 January, 1 July
Emissions to water and land Parameters as required by condition 3.5.1	W1, W2 & W3	Every 12 months	1 January
Emissions to sewer Parameters as required by condition 3.5.1	S1, S2 & S3	Upon completion of IC8a and IC8b	Upon completion of IC8a and IC8b
Process monitoring – digester tank integrity Parameters as required by condition 3.5.1	As specified in schedule 3 table S3.4a	Every 5 years from the date of commissioning or as per the manufacturer's recommendation, whichever is sooner	1 January
Process monitoring – under and over pressure relief systems Parameters as required by condition 3.5.1	As specified in schedule 3 table S3.4a	Every 12 months Yearly summary report of over-pressure and under-pressure events detailing mass balance release	1 January
Process monitoring – pressure relief systems - leak detection and repair (inspection, calibration and maintenance) Parameters as required by condition 3.5.1	As specified in schedule 3 table S3.4a	Every 3 years	1 January

Table S4.1 Reporting of monitoring data			
Parameter	**Emission or monitoring point/reference**	**Reporting period**	**Period begins**
Process monitoring – leak detection and repair surveys Parameters as required by condition 3.5.1	As specified in schedule 3 table S3.4a	Every 12 months LDAR report to be submitted annually	1 January
Process monitoring – use of emergency flare Parameters as required by condition 3.5.1	As specified in schedule 3 table S3.4a	Every 12 months	1 January
Non-compostable contamination removal efficiency Parameters as required by conditions 2.3.4 and 2.3.7	--	Every 12 months Yearly report of detailing contamination removal efficiency and progress with plastic reduction contamination	1 January
Total annual VOCs emissions from gas engines (calculated)	As specified in schedule 3 table S3.4a	Every 12 months	1 January
Bioaerosols monitoring Parameters as required by condition 3.5.1	As specified in schedule 3 table S3.5	Every 3 months or as agreed in writing by the Environment Agency	1 January, 1 April, 1 July, 1 October

Table S4.2 Annual production/treatment	
Parameter	**Units**
Electricity generated	MWh
Liquid digestate	m^3
Solid digestate	tonnes
Recovered outputs	tonnes or m^3

Table S4.3 Performance parameters		
Parameter	**Frequency of assessment**	**Units**
Water usage	Annually	tonnes or m^3
Energy usage	Annually	MWh
Raw material usage	Annually	tonnes or m^3
Emergency flare operation	Annually	hours
Electricity exported	Annually	MWh
CHP engine usage	Annually	hours
CHP engine efficiency	Annually	%
Auxiliary boiler usage	Annually	hours

Table S4.4 Reporting forms		
Media/parameter	**Reporting format**	**Date of form**
Air	Form air 1 or other form as agreed in writing by the Environment Agency	27/01/2025
Bioaerosols	As specified in the Technical Guidance Note M9 or other form as agreed in writing by the Environment Agency	--
Process monitoring	Form process 1 or other form as agreed in writing by the Environment Agency	27/01/2025
Water	Form water 1 or other form as agreed in writing by the Environment Agency	27/01/2025
Sewer	Form sewer 1 or other form as agreed in writing by the Environment Agency	27/01/2025
Water usage	Form water usage 1 or other form as agreed in writing by the Environment Agency	27/01/2025
Energy usage	Form energy 1 or other form as agreed in writing by the Environment Agency	27/01/2025
Other performance indicators	Form performance 1 or other form as agreed in writing by the Environment Agency	27/01/2025
Waste returns	E-waste Return Form or other form as agreed in writing by the Environment Agency	--

Schedule 5 – Notification

These pages outline the information that the operator must provide.

Units of measurement used in information supplied under Part A and B requirements shall be appropriate to the circumstances of the emission. Where appropriate, a comparison should be made of actual emissions and authorised emission limits.

If any information is considered commercially confidential, it should be separated from non-confidential information, supplied on a separate sheet and accompanied by an application for commercial confidentiality under the provisions of the EP Regulations.

Part A

Permit Number	
Name of operator	
Location of Facility	
Time and date of the detection	

(a) Notification requirements for any malfunction, breakdown or failure of equipment or techniques, accident, or emission of a substance not controlled by an emission limit which has caused, is causing or may cause significant pollution	
To be notified within 24 hours of detection	
Date and time of the event	
Reference or description of the location of the event	
Description of where any release into the environment took place	
Substances(s) potentially released	
Best estimate of the quantity or rate of release of substances	
Measures taken, or intended to be taken, to stop any emission	
Description of the failure or accident.	

(b) Notification requirements for the breach of a limit	
To be notified within 24 hours of detection unless otherwise specified below	
Emission point reference/ source	
Parameter(s)	
Limit	
Measured value and uncertainty	
Date and time of monitoring	

(b) Notification requirements for the breach of a limit	
To be notified within 24 hours of detection unless otherwise specified below	
Measures taken, or intended to be taken, to stop the emission	

Time periods for notification following detection of a breach of a limit	
Parameter	**Notification period**

(c) Notification requirements for the detection of any significant adverse environmental effect	
To be notified within 24 hours of detection	
Description of where the effect on the environment was detected	
Substances(s) detected	
Concentrations of substances detected	
Date of monitoring/sampling	

Part B – to be submitted as soon as practicable

Any more accurate information on the matters for notification under Part A.	
Measures taken, or intended to be taken, to prevent a recurrence of the incident	
Measures taken, or intended to be taken, to rectify, limit or prevent any pollution of the environment which has been or may be caused by the emission	
The dates of any unauthorised emissions from the facility in the preceding 24 months.	

Name*	
Post	
Signature	
Date	

* authorised to sign on behalf of the operator

Schedule 6 – Interpretation

“accident” means an accident that may result in pollution.

“anaerobic digestion” means a process of controlled decomposition of biodegradable materials under managed conditions where free oxygen is absent, at temperatures suitable for naturally occurring mesophilic or thermophilic anaerobes and facultative anaerobe bacteria species, which convert the inputs to a methane-rich biogas and whole digestate.

“animal waste” means any waste consisting of animal matter that has not been processed into food for human consumption.

“application” means the application for this permit, together with any additional information supplied by the operator as part of the application and any response to a notice served under Schedule 5 to the EP Regulations.

“appropriate abatement system” means the appropriate treatment technique for channelled emissions to air defined in 6.6.1 ‘Channelled emissions to air’ from the ‘Best Available Techniques (BAT) Reference Document for Waste Treatment’.

“authorised officer” means any person authorised by the Environment Agency under section 108(1) of The Environment Act 1995 to exercise, in accordance with the terms of any such authorisation, any power specified in section 108(4) of that Act.

“Best available techniques” means the most effective and advanced stage in the development of activities and their methods of operation which indicates the practical suitability of particular techniques for providing the basis for emission limit values and other permit conditions designed to prevent and, where that is not practicable, to reduce emissions and the impact on the environment as a whole:

(a) ‘techniques’ includes both the technology used and the way in which the installation is designed, built, maintained, operated and decommissioned;

(b) ‘available techniques’ means those developed on a scale which allows implementation in the relevant industrial sector, under economically and technically viable conditions, taking into consideration the costs and advantages, whether or not the techniques are used or produced inside the Member State in question, as long as they are reasonably accessible to the operator;

(c) ‘best’ means most effective in achieving a high general level of protection of the environment as a whole.

“bioaerosols action levels” mean the acceptable bioaerosols concentrations at the nearest sensitive receptor, or at an equivalent distance downwind of the biowaste treatment operations, which are attributable to the biowaste treatment operations. The acceptable concentrations are respectively 1000 and 500 CFU m^{-3} for total bacteria and Aspergillus fumigatus. Where these action levels are elevated, the operator must take action to mitigate the impact on sensitive receptors.

“Biodegradable” means a material is capable of undergoing biological anaerobic or aerobic degradation leading to the production of CO_2, H_2O, methane, biomass, and mineral salts, depending on the environmental conditions of the process.

“building” means a construction that has the objective of providing sheltering cover and minimising emissions of noise, particulate matter, odour and litter.

“BREF” means Best Available Techniques (BAT) Reference Document.

“Capacity” means the potential capacity and not historical or actual production levels or throughput. This means that the designed capacity is the maximum rate at which the site can operate. Biological treatment of waste usually takes place over more than one day, so the physical daily capacity can be calculated by dividing the maximum quantity of waste that could be subject to biological treatment at any one time by the minimum residence time. For in-vessel composting, the residence time for sanitisation should be calculated separately and then aggregated to the complete composting time. Further guidance ‘RGN2: Understanding the meaning of regulated facility Definition of regulated facility’ is available.

“channelled emissions” means the emissions of pollutants into the environment through any kind of duct, pipe, stack, etc. This also includes emissions from open top biofilters.

“combined heat and power” (CHP) or Cogeneration means the simultaneous generation in one process of thermal energy and electrical or mechanical energy.

“competent persons and resources” means that a technically competent person accredited to a relevant scheme must attend site and record their attendance, and that all roles and responsibilities are clearly stated in the management systems along with records of operatives’ training. See the guidance on the level of competence and duration of attendance

“compliance date” means 01/01/2025 for existing MCPs with net rated thermal input of greater than 5MWth or 01/01/2030 for existing MCPs with a net rated thermal input of less than or equal to 5MWth.

“compost” means solid particulate material that is the result of composting, which has been sanitised and stabilised, and which confers beneficial effects when added to soil, used as a component of growing media or used in another way in conjunction with plants.

“compostable plastics” means waste containing packaging or non-packaging items (or both) with a valid certificate of conformity to EN 13432 or an equivalent standard for compostable and digestible items, the certificate issued by an independent certification body capable of fully biodegrading by a biological process to create compost or digest.

“composting” means the managed biological decomposition of biodegradable waste organic materials, under conditions that are predominantly aerobic and that allow the development of thermophilic temperatures as a result of biologically produced heat and that result in compost.

“composting batch” means an identifiable quantity of material that progresses through the composting system and when fully processed has similar characteristics throughout. For composting systems that operate on a continuous- or plug-flow basis, batches will be taken to mean a series of “portions of production”.

“direct discharge” means discharge to a receiving water body.

“diffuse emissions” mean non-channelled emissions (e.g. of dust, organic compounds, odour) which can result in ‘area’ sources (e.g. tanks) or ‘point’ sources (e.g. pipe flanges). This also includes emissions from open-air windrow composting.

“digestate” means material resulting from an anaerobic digestion process.

“disposal” means any of the operations provided for in Annex I to Directive 2008/98/EC of the European Parliament and of the Council on waste.

“DSEAR” means the Dangerous Substances and Explosive Atmospheres Regulations 2002.

“emissions of substances not controlled by emission limits” means emissions of substances to air, water or land from the activities, either from the emission points specified in schedule 3 or from other localised or diffuse sources, which are not controlled by an emission limit.

“emissions to land” includes emissions to groundwater.

“EP Regulations” means The Environmental Permitting (England and Wales) Regulations SI 2016 No.1154 and words and expressions used in this permit which are also used in the Regulations have the same meanings as in those Regulations.

“existing medium combustion plant” means an MCP which was put into operation before 20 December 2018.

“generator” means any combustion plant which is used to generate electricity, excluding mobile, unless it is connected to the national grid.

“groundwater” means all water, which is below the surface of the ground in the saturation zone and in direct contact with the ground or subsoil.

“impermeable surface” means a surface or pavement constructed and maintained to a standard sufficient to prevent the transmission of liquids beyond the pavement surface.

“Indirect discharge” means a discharge to a sewer or off-site waste water treatment plant.

“Industrial Emissions Directive” and/or “IED” means DIRECTIVE 2010/75/EU OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 24 November 2010 on industrial emissions, as read in accordance with Schedule 1A to the Environmental Permitting (England and Wales) Regulations 2016.

“Leak detection and repair (LDAR) programme’’ means a structured approach to reduce fugitive emissions of organic compounds by detection and subsequent repair or replacement of leaking components. Currently, sniffing (described by EN 15446) and optical gas imaging methods are available for the identification of leaks as set out in BAT 14 and section 6.6.2 of the Waste Treatment BAT Conclusions.

“limited operating hours MCP” means an MCP that meets the requirements of paragraph 8 of Part 2 of Schedule 25A of the Environmental Permitting Regulations.

“MCERTS” means the Environment Agency’s Monitoring Certification Scheme.

“medium combustion plant” or ”MCP” means a combustion plant with a rated thermal input equal to or greater than 1 MW but less than 50 MW.

“Medium Combustion Plant Directive” or “MCPD” means Directive 2015/2193/EU of the European Parliament and of the Council on the limitation of emissions of certain pollutants into the air from medium combustion plants, as read in accordance with Schedule 1A to the Environmental Permitting (England and Wales) Regulations 2016.

“new medium combustion plant” means an MCP which was put into operation after 20 December 2018. This includes replacement MCP and Generators.

“operating hours” means the time, expressed in hours, during which a combustion plant is operating and discharging emissions into the air, excluding start-up and shut-down periods

“operational area” means any part of a facility used for the handling, storing and treatment of waste.

“operator” means in relation to a regulated facility:

(a) the person who has control over the operation of the regulated facility,

(b) if the regulated facility has not yet been put into operation, the person who will have control over the regulated facility when it is put into operation, or

(c) if a regulated facility authorised by an environmental permit ceases to be in operation, the person who holds the environmental permit

“pests” means Birds, Vermin and Insects.

“PFOA” means Perfluorooctanoic acid.

“PFOS” means Perfluorooctanesulphonic acid.

“pollution” means emissions as a result of human activity which may—

(a) be harmful to human health or the quality of the environment,

(b) cause offence to a human sense,

(c) result in damage to material property, or

(d) impair or interfere with amenities and other legitimate uses of the environment.

“quarter” means a calendar year quarter commencing on 1 January, 1 April, 1 July or 1 October.

“recovery” means any of the operations provided for in Annex II to Directive 2008/98/EC of the European Parliament and of the Council on waste.

“Representative internal” – means representative monitoring at a point internally of the windrows that will give a representative assessment of temperature. Note: Larger windrows will require more bespoke temperature equipment to adequate assess temperature profiles accurately.

“sanitisation” means the actively managed and intensive stage of composting, lasting for at least 5 days, characterised by high oxygen demand and temperatures of over 55^{0}C, during which biological processes,

together with conditions in the composting mass, eradicate human and animal pathogens or reduce them to acceptably low levels. The operator also needs to meet ABPR requirements.

“sealed drainage system” in relation to an impermeable surface, means a drainage system with impermeable components which does not leak and which will ensure that:

- no liquids will run off the surface otherwise than via the system
- all liquids entering the system are collected in a sealed sump, except where liquids may be lawfully discharged to foul sewer.

“specified generator” means a group of generators other than excluded between 1 and 50 megawatts or less than 50 megawatts as defined in Schedule 25B(2) of SI 2018 No.110 of the EPR.

“stable” and/or “stabilised” means the degree of processing and biodegradation at which the rate of biological activity has slowed to an acceptably low and consistent level and will not significantly increase under favourable, altered conditions.

“VOC” means Volatile organic compounds as defined in Article 3(45) of Directive 2010/75/EU – ‘volatile organic compound’ means any organic compound as well as the fraction of creosote, having at 293.15K a vapour pressure of 0.01 kPa or more, or having a corresponding volatility under the particular conditions of use.

“Waste code” means the six-digit code referable to a type of waste in accordance with the List of Wastes (England)Regulations 2005, or List of Wastes (Wales) Regulations 2005, as appropriate, and in relation to hazardous waste, includes the asterisk.

“Waste Framework Directive” and/or “WFD” means Waste Framework Directive 2008/98/EC of the European Parliament and of the Council on waste, as read in accordance with Schedule 1A to the Environmental Permitting (England and Wales) Regulations 2016.

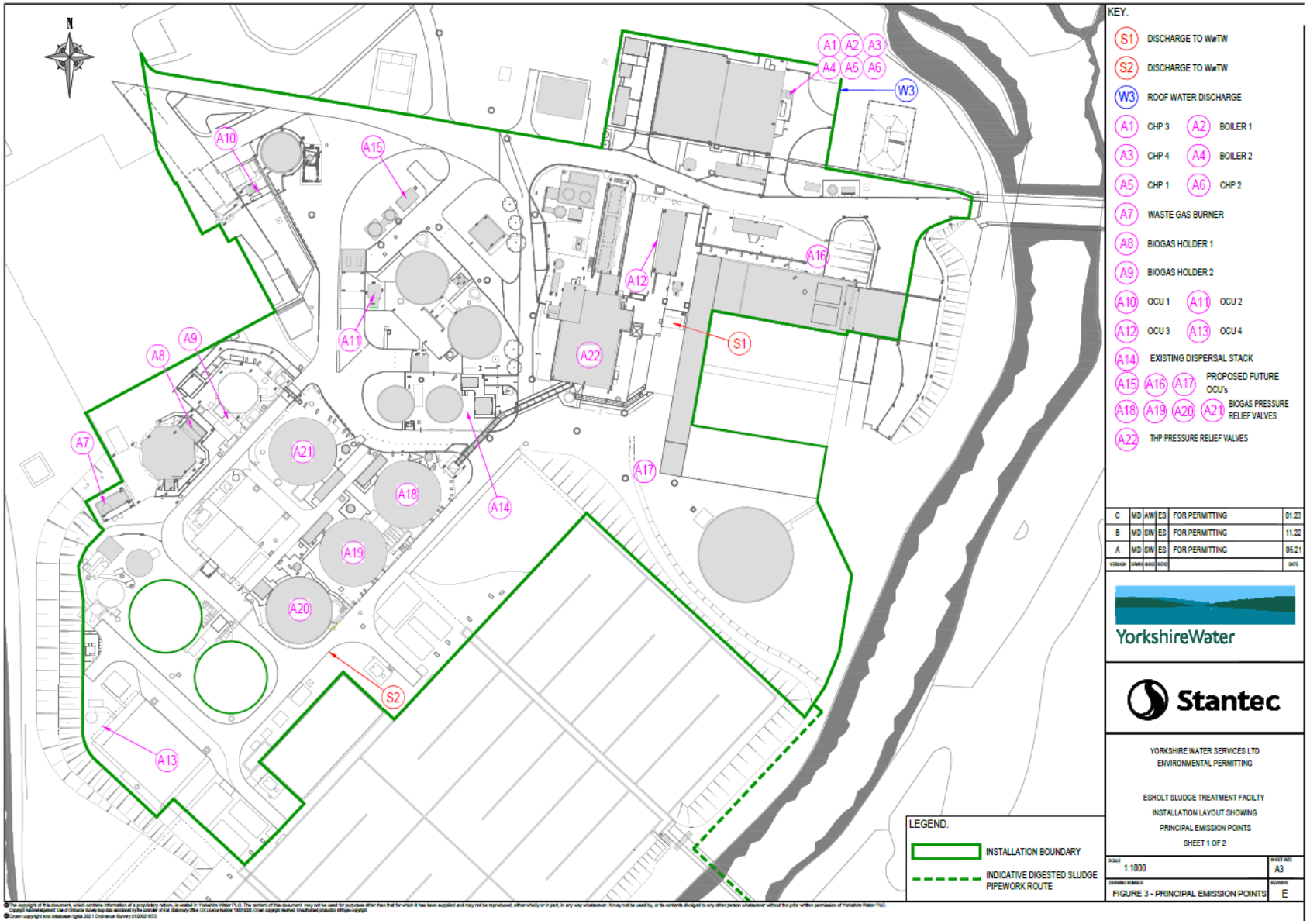
Where a minimum limit is set for any emission parameter, for example pH, reference to exceeding the limit shall mean that the parameter shall not be less than that limit.

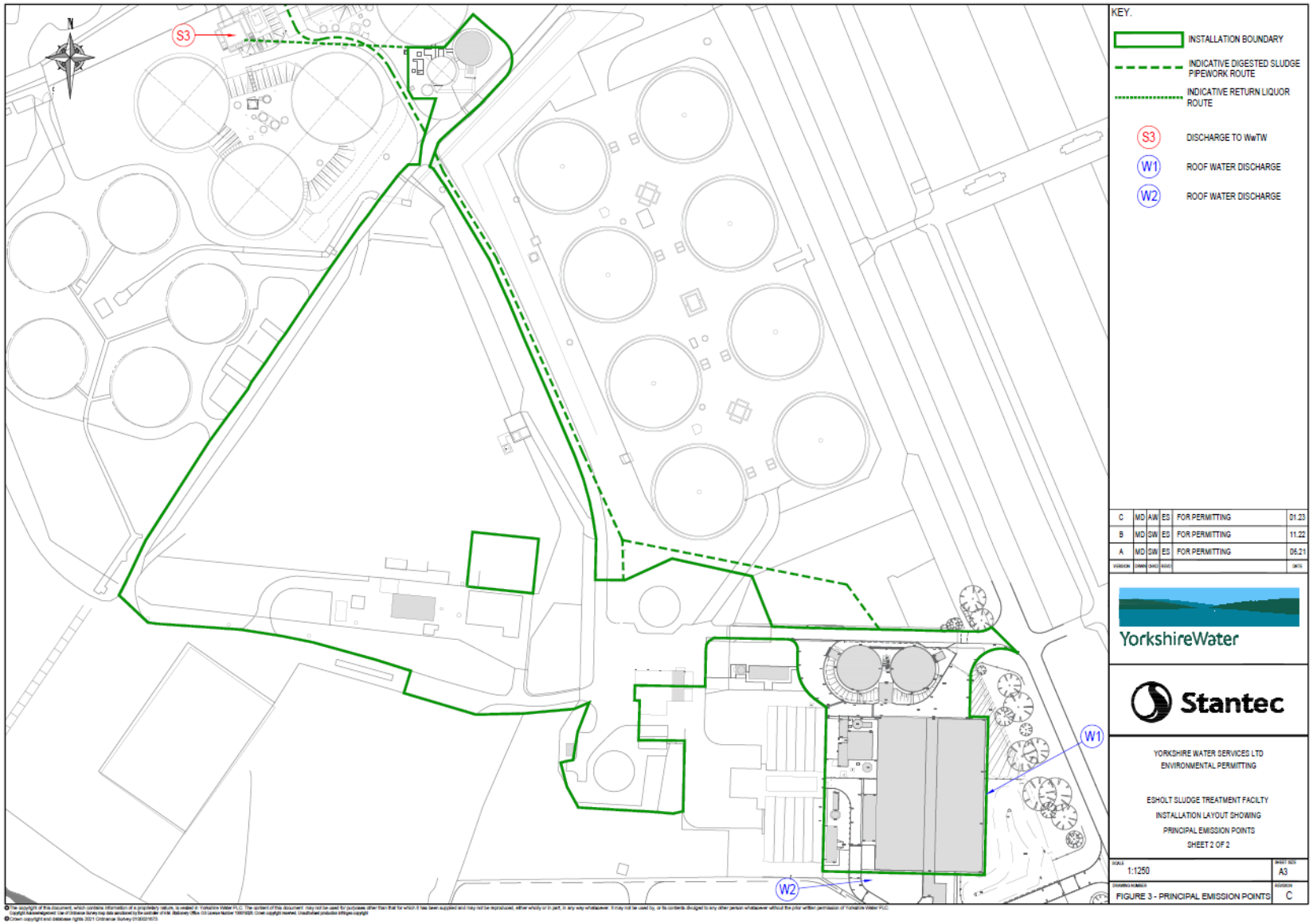
Unless otherwise stated, any references in this permit to concentrations of substances in emissions into air means:

- in relation to emissions from combustion processes, the concentration in dry air at a temperature of 273K, at a pressure of 101.3 kPa and with an oxygen content of 3% dry for liquid fuels and gaseous fuels, 6% dry for solid fuels; and/or
- in relation to emissions from non-combustion sources, the concentration at a temperature of 273K and at a pressure of 101.3 kPa, with no correction for water vapour content.

“year” means a calendar year ending on 31 December.

Schedule 7 – Site plans


N
KEY.
S1 DISCHARGE TO WwTW
S2 DISCHARGE TO WwTW
W3 ROOF WATER DISCHARGE
A1 CHP 3
A2 BOILER 1
A3 CHP 4
A4 BOILER 2
A5 CHP 1
A6 CHP 2
A7 WASTE GAS BURNER
A8 BIOGAS HOLDER 1
A9 BIOGAS HOLDER 2
A10 OCU 1
A11 OCU 2
A12 OCU 3
A13 OCU 4
A14 EXISTING DISPERSAL STACK
A15 A16 A17 PROPOSED FUTURE OCU's
A18 A19 A20 A21 BIOGAS PRESSURE RELIEF VALVES
A22 THP PRESSURE RELIEF VALVES
C MD AW ES FOR PERMITTING 01.23
B MD SW ES FOR PERMITTING 11.22
A MD SW ES FOR PERMITTING 05.21
YorkshireWater
Stantec
YORKSHIRE WATER SERVICES LTD
ENVIRONMENTAL PERMITTING
ESHOLT SLUDGE TREATMENT FACILTY
INSTALLATION LAYOUT SHOWING
PRINCIPAL EMISSION POINTS
SHEET 1 OF 2
1:1000
A3
FIGURE 3 - PRINCIPAL EMISSION POINTS
E
LEGEND.
INSTALLATION BOUNDARY
INDICATIVE DIGESTED SLUDGE PIPEWORK ROUTE



Annex 1 of MCP

1. Rated thermal input (MW) of the medium combustion plant.	CHP 1 – 1.53 MWth CHP 2 – 1.53 MWth CHP 3 – 3.63 MWth CHP 4 – 3.63 MWth Boiler 1 – 6.2 MWth Boiler 2 - 6.2 MWth
2. Type of the medium combustion plant (diesel engine, gas turbine, dual fuel engine, other engine or other medium combustion plant).	CHP 1 – Natural gas CHP 2 – Biogas CHP 3 – Biogas CHP 4 – Biogas Boiler 1 – Biogas or natural gas Boiler 2 – Biogas or natural gas
3. Type and share of fuels used according to the fuel categories laid down in Annex II.	Gaseous fuels other than natural gas Natural gas
4. Date of the start of the operation of the medium combustion plant or, where the exact date of the start of the operation is unknown, proof of the fact that the operation started before 20 December 2018.	CHP 1 – 01/03/2009 CHP 2 – 12/03/2010 CHP 3 – 18/11/2013 CHP 4 – 18/11/2013 Boiler 1 – 03/01/2014 Boiler 2 – 04/01/2014
5. Sector of activity of the medium combustion plant or the facility in which it is applied (NACE code.	37.00
6. Expected number of annual operating hours of the medium combustion plant and average load in use.	CHP 1 – 8,760 hours per year – (as modelled) CHP 2 – 8,760 hours per year – (as modelled) CHP 3 – 8,760 hours per year – (as modelled) CHP 4 – 8,760 hours per year – (as modelled) Boiler 1 – 8,760 hours per year – (as modelled) Boiler 2 – 8,760 hours per year – (as modelled)
7. Where the option of exemption under Article 6(3) or Article 6(8) is used, a declaration signed by the operator that the medium combustion plant will not be operated more than the number of hours referred to in those paragraphs.	N/A

8. Name and registered office of the operator and, in the case of stationary medium combustion plants, the address where the plant is located.	**Company name and registered office:** Yorkshire Water Services Limited Western House, Halifax Road, Bradford, West Yorkshire, BD6 2SZ **Address where the plant is located:** Yorkshire Water Services Limited Esholt Sludge Treatment Facility, Ainsbury House, The Avenue, Idle, Bradford, BD10 0TW

END OF PERMIT