

Notice of variation and consolidation with introductory note

The Environmental Permitting (England & Wales) Regulations 2016

Encyclis Limited
Protos Energy Recovery Facility
Generation Road
Ince
CH2 4JF

Variation application number

EPR/LP3132FX/V010

Permit number

EPR/LP3132FX

Protos Energy Recovery Facility

Permit number EPR/LP3132FX

Introductory note

This introductory note does not form a part of the notice

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 and are subject to the right of appeal.

This variation notice authorises the following changes to the permitted facility:

- Flexibility to choose water treatment technology between options with equivalent environmental impact: Either ion exchange or a reverse osmosis can be used for treatment of the blowdown from hybrid cooling towers.
- Stack re-configuration at the carbon capture facility to increase the structural stability; and
- Increased emission limit value (ELV) for 'Total Nitrosamines expressed as N-nitrosodimethylamine (NDMA)' above limit of detection for the recognised monitoring standards.

Brief description of the process

This permit controls the operation of a waste incineration plant with post combustion carbon capture (CC) and electrically driven carbon dioxide (CO₂) compression plant. The captured CO₂ is pressurised on site before injection into the CO₂ transport pipeline. The Installation includes a fully condensing steam turbine generator for electricity generation and a back pressure turbine generator that provides electricity and heat/steam for the CC plant, with excess electricity being exported to the grid. Emergency gas oil generators will be used to provide electrical power to facilitate a safe shut down.

The relevant listed activities are:

- Section 5.1 Part A(1)(b) – incineration of non-hazardous waste in a waste incineration plant or waste co-incineration plant with a capacity of 3 tonnes or more per hour.
- Section 6.10 Part A(1): Capture of carbon dioxide streams from an installation for the purposes of geological storage.

The permit implements the requirements of the EU Directives on Industrial Emissions and Waste.

The main features of the permit are as follows:

Furnace technology	Moving Grate
Number of lines	2
Principal waste type	Municipal and commercial & industrial
Incinerator stack height	100 m
Carbon capture plant stack height	105 m
Permitted plant capacity	500,000 tonnes per year

Electrical generation capacity (without carbon capture)	49.9 MWe
Gross electrical efficiency (without carbon capture)	33.1%
Electrical generation capacity (with carbon capture)	36.1 MWe
Gross electrical efficiency for condensing turbine (with carbon capture)	30.5%
Gross energy efficiency for back-pressure turbine (with carbon capture)	88.4%
Heat exported to the Carbon Capture plant	56.4 MWth

This Permit allows Encyclis Limited to operate a waste incineration plant with post combustion carbon capture and CO₂ compression plant for the disposal of non-hazardous waste by incineration, and the capture of CO₂ prior to transport off site for sequestration for permanent storage underground. The Installation is located within the 'Protos Park' which itself lies to the east of the village of Ince and north-east of Elton in Cheshire. The city of Chester is approximately 10 km to the south west. Existing industrial plants are located to the south and west of the Installation, and other proposed industries forming the Protos Park are located in the immediate area around the Installation. To the north of the Protos Park lies the Manchester Ship Canal and beyond that, the Mersey Estuary. Development of the Protos Park continues to advance into an industrial hub.

The Mersey Estuary, which is designated as a Special Protection Area (SPA), Ramsar and Site of Special Scientific Interest (SSSI), is located approximately 0.6 km to the north of the Installation. Midland Meres & Mosses Phase 1 and Phase 2 Ramsar sites are located approximately 9.5 km to the south east of the Installation. There are no other Special Areas of Conservation (SACs), SPAs or Ramsar sites located within 10km radius of the Installation and no other SSSIs located within a 2 km radius of the Installation.

Waste will be delivered to the Installation by road, or by shuttle vehicles for waste transported via rail or water. Waste will be received in the reception hall and stored in the bunker before being transferred by cranes to the combustion units. The reception hall and storage area are fully enclosed buildings, which will minimise the potential for release of dust and odour. The combustion units will be operated using moving grate technology, designed to ensure efficient combustion of the waste, through the use of combustion air control and auxiliary burners. The facility is limited to process 500,000 tonnes of waste per annum. The Installation will generate up to 415,200 MWh of electricity, with up to 375,000 MWh being exported while the CC plant is not in operation. The Installation will generate up to 300,400 MWh of electricity, with up to 203,000 MWh being exported when the CC plant is in operation. The Installation will operate with two incineration lines and two CC lines. The full flue gas flow will be extracted from each incineration line using dampers. The dampers will isolate the flue gas from the existing incinerator stacks. Individual ducts will be used to send the flue gases from each line of the incinerator to the CC plant. Exhaust gases from each line of the incinerator will be treated as separate lines in the CC plant.

The incineration plant includes a flue gas cleaning system to control emissions. This includes a Selective Non Catalytic Reduction (SNCR) system, a semi-dry lime acid gas abatement system, and bag filters. When the CC plant is not operational, these abatement systems will remove particulates, acid gases and heavy metals before release to atmosphere via flues in the 100-metre incinerator stacks. Flue gas recirculation has been confirmed to be employed at the incinerator. When the CC plant is in operation, these abatement systems will control emissions of pollutants going into the CC plant to ensure that there is not significant degradation of the amine solution or creation of aerosols. The controls and abatement will ensure that the Installation is operated in compliance with the Industrial Emissions Directive.

The CC plant is located on land to the south-east of the incineration facility. The CC plant will utilise heat from the waste incineration processes for CO₂ stripping, amine solvent regeneration, and flue gas re-heating. Flue gases from the waste incineration process will be monitored for compliance with Waste Incineration (WI) Best Available Techniques Conclusions (BAT-C) limits at monitoring points A1(a) and A2(a) before

entering the CC plant. The CO₂ will be stripped from the flue gases via a weak acid-base reaction with monoethanolamine (MEA) based solvent in a counter flow system, contained in a packed column. The CO₂-depleted exhaust gases will then pass through water wash and acid wash for the abatement of emissions of amines and amine degradation products. Outgoing flue gas will be reheated to aid dispersion before being released from the stacks on top of the absorber towers (A5 and A6). The solvent accumulates impurities and degrades over time, which reduces the effectiveness of the solvent for capturing CO₂, and, therefore, solvent is reclaimed via a thermal solvent reclaiming process.

The CO₂ is removed from the CO₂-rich solvent by increasing the temperature of the solution. The solvent is recirculated within the CC plant. The captured CO₂ gas is cooled and compressed in an intercooled multistage compression system. The compressed CO₂ then goes through additional cleaning and drying stages before it is exported from the Installation for storage off-shore in the Liverpool bay sub-sea depleted oil and gas reservoirs (beyond the boundaries of the Installation and beyond the scope of this permit) through the infrastructure that is part of the wider HyNet Project. The CC plant will capture approximately 49.1 tonnes/hour of CO₂ i.e. up to 412,500 tonnes of CO₂ per year.

There will be no significant aqueous discharge from the facility. Clean surface water will be discharged to Manchester Ship Canal via the East Central Drain. Flue gas quench blowdown and reject water from the water treatment plant (ultra-filtration effluent and either ion exchange or reverse osmosis effluent) will be reused by the ash quench system. Prior to use in the ash quench system, these effluent streams will be separately collected and tested. Blowdown from the acid wash will be sent off-site for disposal.

The Incinerator will produce two types of residues, bottom ash and air pollution control residues, and the CC plant will produce amine solvent residue. Bottom ash will be extracted from the bottom of the moving grate furnace and will be transferred to a designated area prior to export from the Installation for re-use and/or recovery (e.g. in the construction industry). The air pollution control residue will be collected in the ash silo and sent offsite either for re-use and/or recovery. Amine solvent residue will be sent off-site for disposal via high temperature hazardous waste incineration.

Continuous monitoring of particulates, hydrogen chloride, carbon monoxide, oxygen, nitrogen oxides, sulphur dioxide, nitrous oxide, carbon dioxide, volatile organic compounds, ammonia, temperature, pressure, flow, and water vapour content will be undertaken for the flue gases before entering the CC plant or the incineration plant stack. Continuous monitoring of oxygen, water vapour content, temperature, pressure, carbon dioxide and ammonia will be undertaken for the flue gases in the absorber tower stacks.

The plant is operated under an Environmental Management System and a Quality Management System. The Operator plans to gain ISO14001 certification.

The schedules specify the changes made to the permit.

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

Status log of the permit		
Description	Date	Comments
Application received	Duly made 20/02/2006	Application for a waste incineration plant.
Permit determined TP3135LS	21/12/2006	Permit issued to Peel Environmental Ince Limited.
Application EPR/LP3132FX/T001 (full transfer of permit EPR/TP3135LS)	Duly made 16/09/2011	Application to transfer the permit in full to Covanta Energy Limited.
Transfer determined EPR/LP3132FX	03/10/2011	Full transfer of permit complete.
Variation application EPR/LP3132FX/V002	Duly made 03/10/2011	Application to change furnace technology, increase waste throughput and add cooling water discharge emission point.

Status log of the permit		
Description	Date	Comments
Variation determined EPR/LP3132FX	19/03/2012	Varied permit issued.
Variation application determined EPR/LP3132FX/V003	03/05/2012	Environment Agency initiated variation to reflect that the installation is now a multiple operator installation.
Variation application determined EPR/LP3132FX/V004	23/01/2014	Environment Agency variation to implement the changes introduced by the Industrial Emissions Directive.
Application EPR/LP3132FX/S005 and EPR/LP3132FX/V006 (partial surrender, variation and consolidation)	Duly made 25/06/2018	Application to vary the permit to reduce annual throughput, remove land, and change the cooling system and remove multi operator conditions. Application to update the permit to modern conditions.
Additional information received	01/11/2018 02/11/2018	Response to Schedule 5 notice including information on odour management.
Additional information received	26/11/2018	Response to Schedule 5 notice including information on proposed odour abatement for a single line incineration facility.
Additional information received	14/12/2018	Memorandum confirming operating parameters of the odour abatement system for a single incineration line facility.
Variation determined EPR/LP3132FX	29/01/2019	Varied and consolidated permit issued.
Variation application EPR/LP3132FX/V007	Duly made 03/02/2022	Variation primarily to increase in the annual permitted throughput of waste from 400,000 tonnes to 500,000 tonnes.
Variation application determined EPR/LP3132FX/V007	09/01/2023	Variation and consolidation issued.
Regulation 61 notice issued	05/04/2022	Regulation 61 Notice requiring information for Statutory review of permit. BAT Conclusions published 03 December 2019.
Regulation 61 notice response	05/07/2022	
Variation issued EPR/LP3132FX/V008	02/05/2023	Variation and consolidation issued. Name of the Operator changed to Encyclis Limited.
Variation application EPR/LP3132FX/V009	Duly made 24/11/2023	Application to vary the permit to add carbon capture for storage activity, back-pressure turbine, and additional land.
Additional information received	01/03/2024	Response to Schedule 5 notice including revised air quality assessment and environmental risk assessment, information on site CO ₂ management, waste management, effluent treatment, and management plans.
Additional information received	02/04/2024	Response to Schedule 5 notice follow-up questions including information on site CO ₂ management, waste management, effluent treatment, and site infrastructure.
Additional information received	24/05/2024	Response to second Schedule 5 notice including further information on effluent streams and options appraisal for effluent disposal.

Status log of the permit		
Description	Date	Comments
Additional information received	03/06/2024 and 10/06/2024	Response RFI email dated 20/05/2024 including revised Environmental Risk Assessment, revised process flow diagram and clarifications regarding CO ₂ venting.
Additional information received	16/06/2024	Revised Site Condition Report.
Additional information received	05/08/2024	Response to third Schedule 5 notice including additional information on Best Available Techniques (BAT) assessment for effluent disposal, and additional information on CO ₂ venting, emergency diesel generator, monitoring, and chemicals stored and used on site.
Additional information received	30/08/2024	Response to fourth Schedule 5 notice including information on carbon dioxide conditioning and condensate management.
Variation issued EPR/LP3132FX/V009	18/12/2024	Variation and consolidation issued. Address of the Installation updated.
Variation application EPR/LP3132FX/V010	Duly made 03/06/2025	Application to vary the permit to increase the emission limit value (ELV) for nitrosamines from the CC facility, adjust stack configuration at the CC facility, and revise description of the water treatment plant.
Variation issued EPR/LP3132FX/V010	19/09/2025	Variation and consolidation issued.

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

Permit number

EPR/LP3132FX

Issued to

Encyclis Limited ("the operator")

whose registered office is

Floor 4

Lynton House

7-12 Tavistock Square

London

WC1H 9LT

company registration number 05845046

to operate a regulated facility at

Protos Energy Recovery Facility

Generation Road

Ince

CH2 4JF

to the extent set out in the schedules.

The notice shall take effect from 19/09/2025

Name	Date
Principal Permitting Team Leader	19/09/2025

Authorised on behalf of the Environment Agency

Schedule 1

All conditions have been varied by the consolidated permit 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/LP3132FX

This is the consolidated permit referred to in the variation and consolidation notice for application EPR/LP3132FX/V010 authorising,

Encyclis Limited ("the operator"),

whose registered office is

Floor 4

Lynton House

7-12 Tavistock Square

London

WC1H 9LT

company registration number 05845046

to operate an installation at

Protos Energy Recovery Facility

Generation Road

Ince

CH2 4JF

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

Name	Date
Principal Permitting Team Leader	19/09/2025

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; and
 - (c) referenced in schedule 1, table S1.1 (AR1), in accordance with a written other than normal operating conditions (OTNOC) management plan.
- 1.1.2 Records demonstrating compliance with condition 1.1.1 shall be maintained.
- 1.1.3 The operator shall review the written management system at least every 3 years or otherwise as requested by the Environment Agency.
- 1.1.4 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.

1.2 Energy efficiency

- 1.2.1 The operator shall:
- (a) take appropriate measures to ensure that energy is recovered with a high level of energy efficiency and 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.
- 1.2.2 The operator shall provide and maintain steam and/or hot water pass-outs such that opportunities for the further use of waste heat may be capitalised upon should they become practicable.
- 1.2.3 The operator shall review the viability of Combined Heat and Power (CHP) implementation at least every 4 years, or in response to any of the following factors, whichever comes sooner:
- (a) new plans for significant developments within 15 km of the installation;
 - (b) changes to the Local Plan;
 - (c) changes to the UK CHP Development Map or similar; and
 - (d) new financial or fiscal incentives for CHP.

The results shall be reported to the Agency within 2 months of each review, including where there has been no change to the original assessment in respect of the above factors.

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 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 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 or holder.

- 2.3.5 Waste paper, metal, plastic or glass that has been separately collected for the purpose of preparing for re-use or recycling shall not be accepted. Waste from the treatment of these separately collected wastes shall only be accepted if incineration delivers the best environmental outcome in accordance with regulation 12 of the Waste (England and Wales) Regulations 2011.
- 2.3.6 Separately collected fractions other than those listed in condition 2.3.5 shall not be accepted unless they are unsuitable for recovery by recycling.
- 2.3.7 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.
- 2.3.8 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.
- 2.3.9 Waste shall not be charged if:
- (a) the combustion chamber temperature is below 850 °C; or
 - (b) any continuous emission limit value in schedule 3 table S3.1(a) is exceeded during abnormal operation; or
 - (c) any continuous emission limit value in schedule 3 table S3.1 is exceeded, other than during abnormal operation; or
 - (d) continuous emission monitors to demonstrate compliance with any continuous emission limit value in schedule 3 table S3.1 are unavailable other than during abnormal operation; or
 - (e) there is a stoppage, disturbance or failure of the activated carbon abatement system, other than during abnormal operation; or
 - (f) continuous emission monitors to demonstrate compliance with the emission limit values for particulates, TOC or CO in schedule 3 are unavailable, unless alternative techniques, as detailed in the application or as agreed in writing with the Environment Agency, are used to demonstrate compliance with those emission limit values.
- 2.3.10 For the following activities referenced in schedule 1, table S1.1 (AR1) the operator shall record the beginning and end of each period of “abnormal operation”.
- 2.3.11 For the following activities referenced in schedule 1, table S1.1 (AR1) during a period of “abnormal operation”, the operator shall restore normal operation of the failed equipment or replace the failed equipment as soon as possible and incineration exhaust gases shall not be emitted via the carbon capture plant.
- 2.3.12 For the following activities referenced in schedule 1, table S1.1 (AR1) the operator shall interpret the start of the period of “abnormal operation” as the earliest of the following:
- (a) a technically unavoidable stoppage, disturbance, or failure of continuous emission monitors.
 - (b) a technically unavoidable stoppage, disturbance, or failure of the activated carbon abatement system.
 - (c) Any other technically unavoidable stoppage, disturbance, or failure of the plant which is causing or could lead to an exceedance of an emission limit value in table S3.1.
- 2.3.13 For the following activities referenced in schedule 1, table S1.1 (AR1) the operator shall interpret the end of the period of “abnormal operation” as the earliest of the following:

- (a) when the failed equipment is repaired and brought back into normal operation;
- (b) when the operator initiates a shut down of the waste combustion activity, as described in the application or as agreed in writing with the Environment Agency;
- (c) The failed equipment has not been repaired and brought back into normal operation and a single period of abnormal operation reaches a duration of 4 hours after the start of abnormal operation on an incineration line;
- (d) Abnormal operation occurs on an incineration line and the cumulative duration of abnormal operation periods over 1 calendar year has reached 60 hours on that incineration line.

2.3.14 The operator shall have at least one auxiliary burner in each line which shall be operated at start up, shut down and as required during operation to ensure that the operating temperature specified in condition 2.3.9 is maintained as long as incompletely burned waste is present in the combustion chamber. Unless the temperature specified in condition 2.3.9 is maintained in the combustion chamber, such burner(s) shall be fed only with fuels which result in emissions no higher than those arising from the use of gas oil, liquefied gas or natural gas.

2.3.15 Bottom ash and APC residues shall not be mixed.

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.

2.5 Pre-operational conditions

2.5.1 The activities shall not be brought into operation until the measures specified in schedule 1 table S1.4A have been completed.

2.5.2 The operations specified in schedule 1 table S1.4B shall not commence until the measures specified in that table have been completed.

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 and S3.2.

3.1.2 The limits given in schedule 3, subject to condition 3.2.1, shall not be exceeded.

3.1.3 Wastes produced at the site shall, as a minimum, be sampled and analysed in accordance with schedule 3 table S3.4. Additional samples shall be taken and tested and appropriate action taken, whenever:

- (a) disposal or recovery routes change; or
- (b) it is suspected that the nature or composition of the waste has changed such that the route currently selected may no longer be appropriate.

3.2 Emissions limits and monitoring for emission to air for incineration plant

- 3.2.1 The limits for emissions to air apply as follows:
- (a) The limits in table S3.1 shall not be exceeded except during periods of abnormal operation.
 - (b) The limits in table S3.1(a) shall not be exceeded during abnormal operation.
- 3.2.2 Where Continuous Emission Monitors are installed to comply with the monitoring requirements in schedule 3 table S3.1 and S3.1(a); the Continuous Emission Monitors shall be used such that;
- (a) the values of the 95% confidence intervals of a single measured result at the daily emission limit value shall not exceed the following percentages of the emission limit values:

• Carbon monoxide	10%
• Sulphur dioxide	20%
• Oxides of nitrogen (NO & NO ₂ expressed as NO ₂)	20%
• Particulate matter	30%
• Total organic carbon (TOC)	30%
• Hydrogen chloride	40%
• Ammonia	40%
• Mercury	40%
 - (b) valid half-hourly average values or 10-minute averages shall be determined within the effective operating time (excluding the start-up and shut-down periods) from the measured values after having subtracted the value of the confidence intervals in condition 3.2.2 (a);
 - (c) where it is necessary to calibrate or maintain the monitor and this means that data are not available for a complete half-hour or 10 minute period, the half-hourly average or 10-minute average shall in any case be considered valid if measurements are available for a minimum of 20 minutes or 7 minutes during the half-hour or 10-minute period respectively. The number of half-hourly or 10-minute averages so validated shall not exceed 5 or 15 respectively per day;
 - (d) daily average values shall be calculated as follows:
 - (i) the average of valid half hourly averages or 10 minute averages over calendar day excluding half hourly averages or 10 minute averages during periods of abnormal operation. The daily average value shall be considered valid if no more than five half-hourly average or fifteen 10-minute average values in any day have been determined not to be valid;
 - (e) no more than ten daily average values per year shall be determined not to be valid.
- 3.2.3 Emissions of periodically monitored substances shall be determined within the effective operating time (excluding the start-up and shut-down periods).

3.3 Emissions of substances not controlled by emission limits

- 3.3.1 Emissions of substances not controlled by emission limits (excluding odour) 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.
- 3.3.2 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.

- 3.3.3 All liquids in containers, whose emission to water or land could cause pollution, shall be provided with secondary containment, unless the operator has used other appropriate measures to prevent or where that is not practicable, to minimise, leakage and spillage from the primary container.
- 3.3.4 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.

3.4 Odour

- 3.4.1 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.
- 3.4.2 The operator shall:
 - (a) if notified by the Environment Agency that the activities are giving rise to pollution outside the site due to odour, submit to the Environment Agency for approval within the period specified, an odour management plan which identifies and minimises the risks of pollution from odour;
 - (b) implement the approved odour management plan, from the date of approval, unless otherwise agreed in writing by the Environment Agency.

3.5 Noise and vibration

- 3.5.1 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.
- 3.5.2 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.

3.6 Monitoring

- 3.6.1 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 and S3.1(a);
 - (b) process monitoring specified in table S3.3;
 - (c) residue quality in table S3.4.
- 3.6.2 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.

- 3.6.3 Monitoring equipment, techniques, personnel and organisations employed for the emissions monitoring programme and the environmental or other monitoring specified in condition 3.6.1 shall have either MCERTS certification or MCERTS accreditation (as appropriate) unless otherwise agreed in writing by the Environment Agency. Newly installed CEMs, or CEMs replacing existing CEMs, shall have MCERTS certification and unless otherwise agreed in writing by the Environment Agency have an MCERTS certified range which is not greater than 1.5 times the daily emission limit value (ELV) specified in schedule 3 table S3.1. The CEM shall also be able to measure instantaneous values over the ranges which are to be expected during all operating conditions. If it is necessary to use more than one range setting of the CEM to achieve this requirement, the CEM shall be verified for monitoring supplementary, higher ranges. Newly installed Data handling and acquisition systems (DAHS), or DAHS replacing existing DAHS, shall have MCERTS certification.
- 3.6.4 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 and S3.1(a) 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) 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;
 - (b) 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.

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.

4.2 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 using the annual report form specified in schedule 4, table S4.4 or otherwise in a format agreed with the Environment Agency. 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;
- (c) the performance parameters set out in schedule 4 table S4.3;
- (d) the functioning and monitoring of the incineration plant in a format agreed with the Environment Agency. The report shall, as a minimum requirement (as required by Chapter IV of the Industrial Emissions Directive) give an account of the running of the process and the emissions into air and water compared with the emission standards in the IED;
- (e) The function and monitoring of the carbon capture plant in a format agreed with the Environment Agency. The report shall, as a minimum requirement give an account of the running of the process (including a summary of records of process monitoring requirements of table S3.3), the emissions into air compared with the emission limits in table S3.1 and S3.1(a), and details of the waste generated.

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.

4.3 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), (b) or (c) 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 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.

4.3.4 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.

4.3.5 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.

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

4.3.7 Where the operator has entered into a climate change agreement with the Government, the Environment Agency shall be notified within one month of:

(a) a decision by the Secretary of State not to re-certify the agreement;

(b) a decision by either the operator or the Secretary of State to terminate the agreement; and

(c) any subsequent decision by the Secretary of State to re-certify such an agreement.

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	Limits of specified activity
AR1	S5.1 A1 (b)	The incineration of non-hazardous waste in a waste incineration plant (consisting of 2 incineration lines) with a capacity of 3 tonnes per hour or more.	From receipt of waste to emission of exhaust gas and removal from site of waste arising. Waste types and quantities as specified in Table S2.2 of this permit.
AR2	S6.10 A1 (a)	Capture of carbon dioxide streams from an installation for the purposes of geological storage. Operation of a carbon capture plant involving the treatment of exhaust gas from the incineration plant into the carbon capture plant using an amine-based solvent to extract CO ₂ followed by compression, oxygen removal and dehydration of the CO ₂ for off-site transportation and long-term storage, and release of CO ₂ -abated flue gas to atmosphere.	From receipt of exhaust gases from the incineration plant to the carbon capture plant to the treatment of exhaust gas prior to export of CO ₂ from the Installation; release to atmosphere of treated exhaust gases from emission points A5 and A6; or venting of CO ₂ from emission point A7.
Directly Associated Activities			
AR3	Electricity Generation	Generation of up to 49.9 MWe electrical power (gross) using a steam turbine from energy recovered from the flue gases.	
AR4	Emergency Generator	Limited operating hours 2 x 6.2MWth and 1x 1.25MWth (13.65MWth total) input gas oil generators which are Medium Combustion Plant (MCP) for providing emergency electrical power to the plant in the event of supply interruption.	Emergency use to a maximum of 500 hours operation per year per engine. Maximum of 50 hours testing per year per engine.
AR5	Raw materials storage for carbon capture plant	Storage of amine solvent and other reagent for use at the carbon capture plant. Storage of gas oil for use in emergency gas oil generator serving carbon capture plant.	From receipt of raw materials to dispatch for use.
AR6	Waste amine solvent storage	Storage of waste amine solvent generated at the carbon capture plant.	From generation of waste materials to dispatch off-site for disposal.
AR7	Water treatment plant	Water treatment plant, consisting of ultrafiltration and either ion exchange units or a reverse osmosis plant, used for treatment of the blowdown from the hybrid cooling towers.	From receipt of hybrid cooling tower blowdown to dispatch of ultrafiltration and either ion exchange or reverse osmosis effluents into IBA quench system on the Incineration plant and dispatch of the demineralised water for re-use at the carbon capture plant.

Table S1.1 activities			
Activity reference	Activity listed in Schedule 1 of the EP Regulations	Description of specified activity	Limits of specified activity
AR8	Back pressure turbine	Providing steam/heat and electricity for use within the carbon capture plant with excess electricity exported from the site.	
AR9	CO ₂ compression	High pressure compression plant to compress CO ₂ prior to export from the site.	From compression of CO ₂ to its export from the site.

Table S1.2 Operating techniques		
Description	Parts	Date Received
Application TP3135LS	The response to questions B2.1 and B2.2 of the application form and section 2.1 and 2.2 of the supplementary information. Parts of the application have been superseded by variation application EPR/LP3132FX/V002. The document titled 'Further Information' submitted as part of the variation application details the parts that have been superseded.	20/02/2006
Variation application EPR/LP3132FX/V002	The response to questions 2, 3, 5 & 6 of Part C2; and questions 1, 2, 3, 4, 6 and all questions in Appendix 6 of Part C3 of the application form. Including Supporting Information and Further Information. Exclusions to operating techniques: - References and supporting information relating to the discharge of cooling water to surface waters are excluded. - References and supporting information relating to odour control methods are excluded.	08/08/2011 & 14/09/2011
Response to request for information (request made 09/12/2011)	Responses to questions 6, 7, 8, 10, 12, 13 and 14, 15, 16 and 17 in response received on 20/12/2011.	20/12/2011
Variation application EPR/LP3132FX/S005 and EPR/LP3132FX/V006	Supporting information of the application document provided in response to section 3a – technical standards, Part C3 of the application form. Other supporting documents: Operating techniques document, <i>Covanta Protos Refuse Derived Fuel Plant. EP Variation</i>. Ref. S2446-0520-0001JRS (Excluding section 4.3).	Duly made 25/06/2018
Response to Schedule 5 Notice dated 03/10/2018	Operating techniques in response to the Schedule 5 notice: Schedule 5 notice response document with additional information on BAT and operating techniques. Responses in points 4 and 12 only; <i>Covanta Protos. Schedule 5 Response #1</i>. Ref. S2446-0510-0016KLH. (Points 3, 5, 6, 7, 8, 9, 10 and 11 are excluded).	17/10/2018

Table S1.2 Operating techniques		
Description	Parts	Date Received
Response to request for information dated 22/10/2018	Operating techniques in response to the request for information: Memorandum outlining drainage operating techniques, <i>Memorandum. Protos RDF facility drainage arrangements</i>. Ref. S2446-0530-0001JRS.	01/11/2018
Variation application EPR/LP3132FX/V007	Application documents including: Application Forms C2 and C3 and referenced supporting documents: Supporting Information – Covanta EP variation 24/12/21 (Rev 3) Two stream firing Diagram, Drawing no 2446-002, R7	24/12/2021
Response to regulation 61 notice	Operating techniques as set out in the response to the regulation 61 notice.	05/07/2022
Variation application EPR/LP3132FX/V009	Application documents including: Application Forms C2 and C3 and referenced supporting document: Noise impact assessment, Report No. 103036 Version 3, 11/09/2023	Duly made 24/11/2023
Response to first Schedule 5 Notice dated 30/01/2024	Response to questions: 2, 6, 8, 9, and 13 Supporting Information (Rev 6), 28/02/2024 Appendix B - Carbon Capture During Start Up and Shut-Down	01/03/2024
Response to first Schedule 5 Notice follow-up questions dated 21/03/2024	Response to questions: 1, 4, and 8	02/04/2024
Response to third Schedule 5 Notice dated 08/07/2024	Response to questions: 1, 2, 3, 6, 7, and 8	05/08/2024
Response to fourth Schedule 5 Notice dated 31/07/2024	Response to questions: 1, 2, 3, and 4	30/08/2024
Variation application EPR/LP3132FX/V010	Application documents including: Application form parts C2 and C3 and referenced supporting documents: Supporting Information – 02/06/2025 (Rev 3), section 2.1.	Duly made 03/06/2025

Table S1.3 Improvement programme requirements		
Reference	Requirement	Date
IC1	The Operator shall submit a written report to the Environment Agency on the implementation of its Environmental Management System (EMS) and the progress made in the certification of the system by an external body or if appropriate submit a schedule by which the EMS will be certified. The report shall also include details of a review of the OTNOC management plan and any updates to the plan following the review.	Within 12 months of the completion of commissioning of the incineration plant.
IC2	The Operator shall submit a written proposal to the Environment Agency to carry out tests to determine the size distribution of the particulate matter in the exhaust gas emissions to air from emission points A1 and A2, identifying the fractions within the PM ₁₀ , and PM _{2.5} ranges. On receipt of written approval from the Environment Agency to the proposal and the timetable, the Operator shall carry out the tests and submit to the Environment Agency a report on the results.	Within 6 months of the completion of commissioning of the incineration plant.
IC3	The Operator shall submit a written report to the Environment Agency on the commissioning of the waste incineration facility. The report shall summarise the environmental performance of the plant as installed against the design parameters set out in the Applications EPR/LP3132FX/A001 to EPR/LP3132FX/V008. The report shall also include a review of the performance of the facility against the conditions of this permit and details of procedures developed during commissioning for achieving and demonstrating compliance with permit conditions and confirm that the Environmental Management System (EMS) has been updated accordingly.	Within 4 months of the completion of commissioning of the incineration plant.
IC4	The Operator shall submit, for approval with the Environment Agency, a methodology (having regard to Technical Report P4-100/TR Part 2 Validation of Combustion Conditions) to verify the residence time, minimum temperature and oxygen content of the gases in the furnace whilst operating under normal load, minimum turn down and overload conditions.	Report for approval to be submitted at least 2 months before validation testing or as agreed in writing with the Environment Agency.
IC5	The Operator shall notify the Environment Agency of the proposed date(s) that validation testing is planned for.	Notification at least 3 weeks prior to validation testing.
	During commissioning the Operator shall validate the residence time, minimum temperature and oxygen content of the gases in the furnace whilst operating under normal load and most unfavourable operating conditions. The validation shall be to the methodology as approved through improvement condition IC4. The Operator shall submit a written report to the Environment Agency on the validation of residence time, oxygen and temperature whilst operating under normal load, minimum turn down and overload conditions. The report shall identify the process controls used to ensure residence time and temperature requirements are complied with during operation of the incineration plant.	Report submitted within 4 months of the completion of commissioning of the incineration plant.

Table S1.3 Improvement programme requirements		
Reference	Requirement	Date
IC6	The Operator shall submit a written report to the Environment Agency describing the performance and optimisation of: • The Selective Non Catalytic Reduction (SNCR) system and combustion settings to minimise oxides of nitrogen (NO_x). The report shall include an assessment of the level of NO_x, N₂O and NH₃ emissions that can be achieved under optimum operating conditions. • The lime injection system for minimisation of acid gas emissions • The carbon injection system for minimisation of dioxin and heavy metal emissions.	Within 6 months of the completion of commissioning of the incineration plant.
IC7	The Operator shall carry out an assessment of the impact of emissions to air of the following component metals subject to emission limit values: Cd, Tl, Hg, As, Cr, Cu, Mn, and Ni. A report on the assessment shall be made to the Environment Agency. Emissions monitoring data obtained during the first year of operation shall be used to compare the actual emissions with those assumed in the impact assessment submitted with the Application. An assessment shall be made of the impact of each metal against the relevant environmental standard (ES). In the event that the assessment shows that an ES can be exceeded, the report shall include proposals for further investigative work.	15 months from the completion of commissioning of the incineration plant.
IC8a	The Operator shall submit a written summary report to the Environment Agency to confirm the results of calibration and verification testing that the performance of Continuous Emission Monitors for parameters as specified in Table S3.1 and Table S3.1(a) complies with the requirements of BS EN 14181, specifically the requirements of QAL1, QAL2 and QAL3. The report shall include the results of calibration and verification testing.	Initial calibration report to be submitted to the Environment Agency within 3 months of completion of commissioning of the incineration plant. Full summary evidence compliance report to be submitted within 18 months of completion of commissioning of the incineration plant.
IC8b	The Operator shall submit a written summary report to the Environment Agency to confirm the results of calibration and verification testing that the performance of Continuous Emission Monitors for parameters as specified in Table S3.1 complies with the requirements of BS EN 14181, specifically the requirements of QAL1, QAL2 and QAL3. The report shall include the results of calibration and verification testing.	Initial calibration report to be submitted to the Environment Agency within 3 months of completion of commissioning of the carbon capture plant.

Table S1.3 Improvement programme requirements		
Reference	Requirement	Date
		Full summary evidence compliance report to be submitted within 18 months of completion of commissioning of the carbon capture plant.
IC9	-	Completed.
IC10	During commissioning, the Operator shall carry out tests to demonstrate whether the furnace combustion air will ensure that negative pressure is achieved throughout the reception hall. The tests shall demonstrate whether air is pulled through the reception hall and bunker area and into the furnace with dead spots minimised. The Operator shall also carry out tests of methods used to maintain negative pressure during shut-down periods to ensure that adequate extraction will be achieved. The operator shall submit a report to the Environment Agency, for approval, summarising the findings along with any proposed improvements if required.	Within 3 months of completion of commissioning of the incineration plant.
IC11	The operator shall perform a study to determine the extent to which the operation of the current systems in place at the plant to minimise NOx emissions can be further optimised such that emissions are reduced as far as possible below 180 mg/Nm³ as a daily average, without significantly increasing emissions of other pollutants or having a significant negative effect on plant operation, reliability or bottom ash quality. The study shall be based on the results of trials carried out at the installation and shall have regard to the recommendations for test conditions set out in Section 5.4.3 of report titled 'Establishing factors that influence NOx reduction at waste incineration plant to levels below the upper end of the BAT-AELs' (dated 14/01/2022), or other methodology agreed in writing with the Environment Agency. A written report of the study shall be submitted to the Environment Agency which shall include but not necessarily be limited to the following: • A brief description of the currently installed measures at the installation to minimise NOx emissions, including details of how the reagent dosing system responds to emissions monitoring data and historic data which illustrates the current achievable level of daily NOx emissions. • The results of trials conducted to further reduce daily average NOx emissions using currently installed measures, including: ○ a description of the parameters that were varied during the trial e.g. ammonia or urea feed rates,	Within 12 months of completion of commissioning of the incineration plant.

Table S1.3 Improvement programme requirements		
Reference	Requirement	Date
	physical form of urea injected, air flows, and the range over which they were varied. - the levels of NO_x achieved and associated levels of ammonia and nitrous oxide emissions and reagent consumption. - observed effects and predicted long-term impacts on plant operation, reliability and maintenance regime. - any changes to the composition of the bottom ash and boiler ash and the implications of those changes for the ability to process and use the ash, as well as for the pollution potential of the ash both during processing and its subsequent use as a secondary aggregate. - any other relevant cross-media effects. The report shall also include a description of the extent to which current systems in place at the plant to minimise NO_x emissions can be optimised on a permanent basis, including justification and an implementation plan where relevant.	
IC12	The operator shall submit a report to the Environment Agency on whether waste feed to the plant can be proven to have a low and stable mercury content. The report shall have regard to BAT 4 of the BAT conclusions, be based on historic mercury emissions monitoring data and have regard to the Environment Agency Mercury Monitoring Protocol.	Within 6 months of completion of commissioning of the incineration plant or as otherwise agreed in writing with the Environment Agency.
IC13	The operator shall submit a report to the Environment Agency on whether dioxin emissions to air are stable. The report shall have regard to BAT 4 of the BAT conclusions, be based on historic dioxin emissions monitoring data and have regard to the Environment Agency Dioxins Monitoring Protocol.	Within 6 months of completion of commissioning of the incineration plant or as otherwise agreed in writing with the Environment Agency.
IC14	The operator shall calculate the gross electrical efficiency using the method set out in the general considerations section of the BAT conclusions and submit details of the calculation to the Environment Agency. The calculation shall use the R1 efficiency status, boiler efficiency determination guidance (or other methodology as agreed in writing with the Environment Agency) to calculate boiler efficiency which can then be used to calculate Q_{th}. Where the calculated gross electrical efficiency is below the range specified in BAT 20 of the BAT conclusions, the operator shall carry out an assessment of the opportunities to increase the energy efficiency of the installation.	Within 12 months of completion of commissioning of the incineration plant.

Table S1.3 Improvement programme requirements		
Reference	Requirement	Date
	The assessment shall include but not necessarily be limited to: • Improvements that could be made to the furnace (including control systems) in order to increase the amount of thermal energy produced per unit of thermal energy in the waste. • Where relevant, improvements that could be made to the steam system and related components to allow a greater quantity of electricity to be generated per unit of thermal energy in the steam. • Improvements in the heat and electrical efficiency of the plant's ancillary systems that could be made in order to reduce the heat and electrical loads of the plant. • Where relevant, an implementation plan for the improvements identified, including the anticipated increase in the gross and/or net electrical efficiency of the plant which would be achieved. A written copy of the assessment shall be submitted to the Environment Agency.	
IC15	<u>Monitoring standards</u> During commissioning, the operator shall carry out tests to assess whether the air monitoring location(s) meet the requirements of BS EN 15259 and supporting Method Implementation Document (MID). A written report shall be submitted for approval setting out the results and conclusions of the assessment including where necessary proposals for improvements to meet the requirements. The report shall specify the design of the ports for PM10 and PM2.5 sampling. Where notified in writing by the Environment Agency that the requirements are not met, the operator shall submit proposals or further proposals for rectifying this in accordance with the time scale in the notification. The proposals shall be implemented in accordance with the Environment Agency's written approval.	Report to be submitted to the Agency within 3 months of completion of commissioning of the carbon capture plant.
IC16	<u>Commissioning of the carbon capture plant</u> The Operator shall submit a written report to the Environment Agency for assessment and written approval on the commissioning of carbon capture plant. The report shall summarise the environmental performance of the plant as set out in the commissioning plan required by pre operational condition POM3 in table S1.4B of this permit. The report shall include:	Within 6 months of the completion of commissioning of the carbon capture plant.

Table S1.3 Improvement programme requirements		
Reference	Requirement	Date
	- a summary of the environmental performance of the carbon capture plant as installed against the design parameters and risk assessments set out in the application EPR/LP3132FX/V009 and updated in response to the pre-operational conditions in this permit; - a review of the performance of the carbon capture plant against the conditions of this permit and details of procedures developed during commissioning for achieving and demonstrating compliance with permit conditions and confirm that the Environmental Management System (EMS) has been updated accordingly.	
IC17	<u>Carbon capture efficiency</u> The Operator shall submit a written report to the Environment Agency for assessment and written approval detailing the carbon capture efficiency of the carbon capture plant under normal operating conditions (calculated using the methodology as approved in accordance with pre-operational condition POM3 in table S1.4B of this permit) averaged over one year of operation as specified in table S3.3 of this permit. Should the carbon capture efficiency during normal operating conditions be reported to be less than the design capture performance specification of 95%, the Operator shall carry out an analysis of the issues affecting the performance of the plant with respect to achievement of the 95% carbon capture rate and either: - Submit written proposals for remedial actions to the Environment Agency for approval designed to improve capture efficiency, or; - provide a written justification to the Environment Agency that a 95% capture rate is not reasonably achievable and that no further remedial action is to be taken.	Within 15 months of the completion of commissioning of the carbon capture plant.
IC18	<u>Amine solvent degradation</u> The Operator shall submit a written report to the Environment Agency for assessment and written approval on the degradation of absorber solvent quality. The report shall review the findings from the monitoring of absorber solvent quality over 12 months of operation, including but not limited to, the monitoring carried out in accordance with table S3.3 of this permit. The report shall include: - an investigation into the reasons for solvent degradation and how degradation affects the performance of the plant over time. - a review of the options for reducing the rate of solvent degradation; and	Within 15 months from the completion of commissioning of the carbon capture plant.

Table S1.3 Improvement programme requirements		
Reference	Requirement	Date
	proposals for the implementation of any measures identified from the review. The proposals shall be implemented in accordance with the Environment Agency's written approval.	
IC19	<u>Air emissions risk assessment (Carbon capture plant)</u> The Operator shall submit a written report to the Environment Agency for technical assessment and written approval. The report must contain an emissions to air risk assessment in line with the Environment Agency's guidance which is based on sampled and monitored emissions data from emission points A5 and A6 in table S3.1. Emissions monitoring data obtained during the first year of operation shall be used to compare the actual emissions with those assumed in the impact assessment submitted with the permit application EPR/LP3132FX/V009. For those parameters not included in the original impact assessment, or those showing to be at concentrations higher than those assumed, in the impact assessment submitted in the application, an assessment shall be made of the impact to human health and habitats of each parameter using the 'Air emissions risk assessment for your environmental permit - GOV.UK (www.gov.uk)' guidance. Where Environmental Assessment Levels (EALs) for emitted substances are not available on the current published EAL list on gov.uk the operator should propose a new EAL. To derive a new EAL, the operator should follow the Environment Agency's published guidance on air emissions risk assessments.	Within 15 months of commencement of operation of the carbon capture plant.
IC20	<u>Commencement of bi-annual monitoring</u> The Operator shall submit a written report to the Environment Agency for assessment and written approval with reference to the monitoring requirements set in table S3.1 of this permit for emissions from the absorber tower stacks (points A5 and A6). The report must contain: - the results of tests carried out for species to be considered for bi-annual monitoring - assessment of the results and conclusions of the assessment - proposals to change monitoring to bi-annual The proposals shall be implemented in accordance with the Environment Agency's written approval.	After at least 12 months of operation and then at least 3 months prior to the proposed start of bi-annual monitoring at A5 and A6.

Table S1.4A Pre-operational measures	
Reference	Pre-operational measures
PO1	Completed on 20/06/2023.
PO2	Completed on 27/10/2023.
PO3	Completed on 31/05/2024.
PO4	Completed on 02/12/2024.
PO5	Completed on 02/11/2023.
PO6	Completed on 06/01/2022.
PO7 (Superseded by PO14)	Prior to the commencement of commissioning, the Operator shall submit a report, and obtain the Environment Agency's written approval to it, on the baseline conditions of soil and groundwater at the installation. The report shall contain the information necessary to determine the state of soil and groundwater contamination so as to make a quantified comparison with the state upon definitive cessation of activities provided for in Article 22(3) of the IED. The report shall contain information, supplementary to that already provided in application Site Condition Report, needed to meet the information requirements of Article 22(2) of the IED.
PO8	Not required.
PO9	Completed on 27/06/2023.
PO10	Completed on 09/01/2023.
PO11	Completed on 09/01/2023.
PO12	Completed on 10/12/2024.
PO13	Completed on 09/01/2023.
PO14	Prior to the commencement of commissioning, the Operator shall update the Site Condition report, supplementary to that already provided in response to PO7 to provide adequate information to meet the information requirements of Article 22(2) of the IED.

Table S1.4B Pre-operational measures for future development		
Reference	Operation	Pre-operational measures
POM1	Commissioning of the carbon capture plant	<u>Storage and secondary containment</u> At least 3 months prior to the commencement of commissioning of the carbon capture plant, the Operator shall submit a written report to the Environment Agency for assessment and written approval. The report must contain: Detailed design for all containment structures which contain relevant hazardous substances including tanks and pipework as well as secondary and tertiary containment where required. The Operator must implement the proposals in the report as agreed with the Environment Agency's written approval.
POM2	Commissioning of the carbon capture plant	<u>Pollution prevention measures</u> At least 3 months prior to the commencement of commissioning of the carbon capture plant, the Operator shall submit a written plan to the Environment Agency for assessment and written approval.

Table S1.4B Pre-operational measures for future development		
Reference	Operation	Pre-operational measures
		The plan must contain: Pollution prevention measures including inspection and maintenance plans and procedures around the storage and use of all chemicals identified as relevant hazardous substances in the Stage 1-3 assessment of the Site Condition Report. The Operator must implement the proposals in the report as agreed with the Environment Agency's written approval.
POM3	Commissioning of the carbon capture plant	<u>Commissioning plan</u> At least 3 months prior to the commencement of commissioning of the carbon capture plant, the Operator shall submit a written commissioning plan, including timelines for completion, for assessment and written approval by the Environment Agency. The commissioning plan shall include, but not be limited to: - The timelines for the commissioning and the expected durations of these activities. - The expected emissions to the environment during the different stages of commissioning; risk assessment demonstrating that the environmental risks are not significant throughout all the phases of commissioning; the expected durations of commissioning activities and the actions to be taken to protect the environment and report to the Environment Agency in the event that actual emissions exceed expected emissions. - A Commissioning Monitoring Plan. - A methodology for approval to demonstrate the carbon capture efficiency of the plant. The approved methodology shall be used to demonstrate the carbon capture efficiency of the plant as part of the commissioning activities, and, after the commissioning phase, for process monitoring and reporting purposes in compliance with the conditions of the permit. - A methodology for approval for quantifying total mass of CO₂ emissions during short duration venting that may be required during the start-up sequence of the carbon capture plant and during other than normal operating conditions. The commissioning activities shall be carried out in accordance with the commissioning plan approved by the Environment Agency.
POM4	Commissioning of the carbon capture plant	<u>Process effluent monitoring</u> At least 3 months prior to the commencement of commissioning of the carbon capture plant, the operator shall submit a written procedure to the Environment Agency for approval. The written procedure shall include: - A plan for routine effluent sampling and monitoring to confirm the hazard status of each individual effluent stream (flue gas quench blowdown, ultra filtration effluent and ion exchange effluent) that is proposed to be mixed with incinerator bottom ash (IBA). - Details of how an effluent stream will be separately disposed of (without mixing with the IBA) if monitoring results show it is hazardous.

Table S1.4B Pre-operational measures for future development		
Reference	Operation	Pre-operational measures
		The Operator must implement the proposals in the procedure as agreed with the Environment Agency's written approval. Effluents shall not be added to the IBA until written approval has been provided by the Environment Agency.
POM5	Commissioning of the carbon capture plant	<u>Process monitoring methods</u> Following the completion of the final design of the installation and at least 6 months prior to the commencement of commissioning of the carbon capture plant, the Operator shall submit to the Environment Agency for assessment and written approval proposed methodologies for the following process monitoring requirements for absorber amine solvent quality as required in table S3.3 of this permit: • Percent active amine (MEA). • Carbon dioxide loading (rich amine). • Heat stable salts. • Soluble iron concentration (rich and lean amine). • Colour.
POM6	Commissioning of the carbon capture plant	<u>CO₂ assessment</u> Following the completion of the final design of the installation and at least 12 months prior to the commencement of commissioning of the carbon capture plant, the Operator shall submit to the Environment Agency for assessment and written approval: • A report that validates the assumptions used in the CO₂ venting emissions to air risk assessment presented in the application EPR/LP3132FX/V009. • If any of the input parameters to the CO₂ venting assessment are different to those assumed in the assessment submitted in variation V009, the Operator shall submit an updated assessment of the impact of CO₂ emissions on human health from the short duration venting that may be required during the start-up sequence of the carbon capture plant, during other than normal operating conditions and plant commissioning. The assessment shall be carried out in accordance with environmental risk assessment methodology set out in Environment Agency guidance https://www.gov.uk/guidance/air-emissions-risk-assessment-for-your-environmental-permit and Environmental permitting: air dispersion modelling reports - GOV.UK (www.gov.uk). The assessment must show that CO₂ concentrations at locations of public exposure are below the levels at which onset of symptoms and effects are reported. • A management plan detailing operating techniques to minimise potential CO₂ phase changes, solid effects and dense gas behaviour when venting CO₂ to atmosphere. The Operator must implement the proposals in the plan in line with the Environment Agency's written approval.

Table S1.4B Pre-operational measures for future development		
Reference	Operation	Pre-operational measures
POM7	Commissioning of the carbon capture plant	<u>Carbon capture plant other than normal operating conditions (OTNOC) plan</u> Following the completion of the final design of the carbon capture plant and prior to the commencement of commissioning of the carbon capture plant, the Operator shall submit to the Environment Agency for assessment and written approval a post combustion carbon capture (PCC) plant OTNOC management plan. The plan shall include: (i) Any potential ‘other than normal operating conditions (OTNOC)’ for the carbon capture plant, taking into consideration both internal and external causes of OTNOC. (ii) Details of measures to: • minimise the occurrence of OTNOC that are within the operator’s control; and • reduce the impact of all OTNOC events. (iii) Proposals for reviewing and optimising capture performance periodically so capture rates are as high as reasonably practicable during these periods. The OTNOC plan shall be included in the EMS.
POM8	Commissioning of the carbon capture plant	<u>Monitoring standards</u> At least six months before (or other date agreed in writing with the Environment Agency) the commencement of commissioning of the carbon capture plant, the Operator shall submit a written report to the Environment Agency, and obtain the Environment Agency’s written approval for it, specifying arrangements for continuous and periodic monitoring of emissions to air from the Installation’s emission points to comply with EN 15259 and Environment Agency guidance notes on monitoring stack emissions measuring locations, techniques and standards for periodic monitoring and TGN M20 for quality assurance of CEMS. The report shall include the following: • Details of monitoring locations, access and working platforms. • Evidence that CEMS are MCERTS certified at the appropriate range. • Evidence that data handling and acquisition systems are MCERTS certified. • Methods and standards for periodic monitoring. • Procedures for the quality assurance of CEMS, which includes evidence of completion of CEMS’ functional tests and setting up quality assurance level (QAL) 3 checks, prior to completing a QAL2.
POM9	Commissioning of the carbon capture plant	<u>Site condition report</u> Prior to the commencement of commissioning of the carbon capture plant, the Operator shall update the Site Condition Report (to cover the whole Installation), supplementary to that already provided in response to PO7 and PO14 to provide adequate information to meet the information requirements of Article 22(2) of the IED.

Schedule 2 – Waste types, raw materials and fuels

Table S2.1 Raw materials and fuels	
Raw materials and fuel description	Specification
Fuel Oil	< 0.1% sulphur content.
Monoethanolamine (MEA)	Diethanolamine (DEA) not exceeding 0.2% content (unless otherwise agreed with the Environment Agency).

Table S2.2 Permitted waste types and quantities for the waste incineration plant	
Maximum quantity	The annual waste throughput for the waste incineration plant shall not exceed 500,000 tonnes
Waste code	Description
03	Wastes from wood processing and the production of panels and furniture, pulp, paper and cardboard
03 01	wastes from wood processing and the production of panels and furniture
03 01 01	waste bark and cork
03 01 05	sawdust, shavings, cuttings, wood, particle board and veneer other than those mentioned in 03 01 04
03 03	wastes from pulp, paper and cardboard production and processing
03 03 01	waste bark and wood
03 03 07	mechanically separated rejects from pulping of waste paper and cardboard
15	Waste packaging, absorbents, wiping cloths, filter materials and protective clothing not otherwise specified
15 01	packaging (including separately collected municipal packaging waste)
15 01 01	paper and cardboard packaging
15 01 02	plastic packaging
15 01 03	wooden packaging
15 01 05	composite packaging
15 01 06	mixed packaging
15 01 09	textile packaging
17	Construction and demolition wastes (including excavated soil from contaminated sites)
17 02	wood, glass and plastic
17 02 01	wood
17 02 03	plastic
17 09	other construction and demolition wastes
17 09 04	mixed construction and demolition wastes other than those mentioned in 17 09 01, 17 09 02 and 17 09 03
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)

Table S2.2 Permitted waste types and quantities for the waste incineration plant	
Maximum quantity	The annual waste throughput for the waste incineration plant shall not exceed 500,000 tonnes
Waste code	Description
19 02 03	premixed wastes composed only of non-hazardous wastes
19 05	wastes from aerobic treatment of solid wastes
19 05 01	non-composted fraction of municipal and similar wastes
19 05 02	non-composted fraction of animal and vegetable waste
19 05 03	off-specification compost
19 06	wastes from anaerobic treatment of waste
19 06 04	digestate from anaerobic treatment of municipal waste
19 06 06	digestate from anaerobic treatment of animal and vegetable waste
19 10	wastes from shredding of metal-containing wastes
19 10 04	fluff-light fraction and dust other than those mentioned in 19 10 03
19 10 06	other fractions other than those mentioned in 19 10 05
19 12	wastes from the mechanical treatment of waste (for example sorting, crushing, compacting, pelletising) not otherwise specified
19 12 01	paper and cardboard
19 12 04	plastic and rubber
19 12 07	wood other than that mentioned in 19 12 06
19 12 08	textiles
19 12 10	combustible waste (refuse derived fuel)
19 12 12	other wastes (including mixtures of materials) from mechanical treatment of wastes other than those mentioned in 19 12 11
20	Municipal wastes (household waste and similar commercial, industrial and institutional wastes) including separately collected fractions
20 01	separately collected fractions (except 15 01)
20 01 01	paper and cardboard
20 01 08	biodegradable kitchen and canteen waste
20 01 10	clothes
20 01 11	textiles
20 01 38	wood other than that mentioned in 20 01 37
20 01 39	plastics
20 02	garden and park wastes (including cemetery waste)
20 02 01	biodegradable waste
20 03	other municipal wastes
20 03 01	mixed municipal waste
20 03 02	waste from markets
20 03 03	street-cleaning residues
20 03 07	bulky waste

Schedule 3 – Emissions and monitoring

Table S3.1 Point source emissions to air – emission limits and monitoring requirements.						
Emission point ref. & location	Parameter	Source	Limit (including unit)	Reference period	Monitoring frequency	Monitoring standard(s) or method(s)
A1 and A2 (as shown on site plan in Schedule 7) ^{Note1}	Particulate matter	Incineration exhausts gases via incineration plant stack	30 mg/m ³	½-hr average	Continuous	EN 14181
A1 and A2 (as shown on site plan in Schedule 7) ^{Note1}	Particulate matter	Incineration exhausts gases via incineration plant stack	5 mg/m ³	daily average	Continuous	EN 14181
A1 and A2 (as shown on site plan in Schedule 7) ^{Note1}	Total Organic Carbon (TOC)	Incineration exhausts gases via incineration plant stack	20 mg/m ³	½-hr average	Continuous	EN 14181
A1 and A2 (as shown on site plan in Schedule 7) ^{Note1}	Total Organic Carbon (TOC)	Incineration exhausts gases via incineration plant stack	10 mg/m ³	daily average	Continuous	EN 14181
A1 and A2 (as shown on site plan in Schedule 7) ^{Note1}	Hydrogen chloride	Incineration exhausts gases via incineration plant stack	60 mg/m ³	½-hr average	Continuous	EN 14181
A1 and A2 (as shown on site plan in Schedule 7) ^{Note1}	Hydrogen chloride	Incineration exhausts gases via incineration plant stack	8 mg/m ³	daily average	Continuous	EN 14181
A1 and A2 (as shown on site plan in Schedule 7) ^{Note1}	Hydrogen fluoride	Incineration exhausts gases via incineration plant stack	1 mg/m ³	Average of three consecutive measurements of at least 30 minutes each	Quarterly in first year of operation then Bi-annually	CEN TS 17340

Table S3.1 Point source emissions to air – emission limits and monitoring requirements.						
Emission point ref. & location	Parameter	Source	Limit (including unit)	Reference period	Monitoring frequency	Monitoring standard(s) or method(s)
A1 and A2 (as shown on site plan in Schedule 7) ^{Note1}	Carbon monoxide	Incineration exhausts gases via incineration plant stack	150 mg/m ³	95% of all 10-minute averages in any 24-hour period	Continuous	EN 14181
A1 and A2 (as shown on site plan in Schedule 7) ^{Note1}	Carbon monoxide	Incineration exhausts gases via incineration plant stack	50 mg/m ³	daily average	Continuous	EN 14181
A1 and A2 (as shown on site plan in Schedule 7) ^{Note1}	Sulphur dioxide	Incineration exhausts gases via incineration plant stack	200 mg/m ³	½-hr average	Continuous	EN 14181
A1 and A2 (as shown on site plan in Schedule 7) ^{Note1}	Sulphur dioxide	Incineration exhausts gases via incineration plant stack	40 mg/m ³	daily average	Continuous	EN 14181
A1 and A2 (as shown on site plan in Schedule 7) ^{Note1}	Oxides of nitrogen (NO and NO ₂ expressed as NO ₂)	Incineration exhausts gases via incineration plant stack	400 mg/m ³	½-hr average	Continuous	EN 14181
A1 and A2 (as shown on site plan in Schedule 7) ^{Note1}	Oxides of nitrogen (NO and NO ₂ expressed as NO ₂)	Incineration exhausts gases via incineration plant stack	180 mg/m ³	daily average	Continuous	EN 14181
A1 and A2 (as shown on site plan in Schedule 7) ^{Note1}	Cadmium & thallium and their compounds (total)	Incineration exhausts gases via incineration plant stack	0.02 mg/m ³	Average of three consecutive measurements of at least 30 minutes each	Quarterly in first year of operation then bi-annually	BS EN 14385

Table S3.1 Point source emissions to air – emission limits and monitoring requirements.						
Emission point ref. & location	Parameter	Source	Limit (including unit)	Reference period	Monitoring frequency	Monitoring standard(s) or method(s)
A1 and A2 (as shown on site plan in Schedule 7) ^{Note1}	Mercury and its compounds	Incineration exhausts gases via incineration plant stack	0.02 mg/m ³ Limit does not apply if continuous monitoring has been specified by the Environment Agency	Average of three consecutive measurements of at least 30 minutes each	Quarterly in first year of operation then bi-annually Not required if continuous monitoring has been specified by the Environment Agency	BS EN 13211
A1 and A2 (as shown on site plan in Schedule 7) ^{Note1}	Mercury and its compounds	Incineration exhausts gases via incineration plant stack	0.02 mg/m ³	Daily average	Continuous Not required unless continuous monitoring has been specified by the Environment Agency in line with sampling protocol	EN 14181
A1 and A2 (as shown on site plan in Schedule 7) ^{Note1}	Sb, As, Pb, Cr, Co, Cu, Mn, Ni and V and their compounds (total)	Incineration exhausts gases via incineration plant stack	0.3 mg/m ³	Average of three consecutive measurements of at least 30 minutes each	Quarterly in first year of operation then bi-annually	BS EN 14385
A1 and A2 (as shown on site plan in Schedule 7) ^{Note1}	Exhaust gas temperature	Incineration exhausts gases via incineration plant stack	No limit set	-	Continuous	Traceable to national standards
A1 and A2 (as shown on site plan in Schedule 7) ^{Note1}	Exhaust gas pressure	Incineration exhausts gases via incineration plant stack	No limit set	-	Continuous	Traceable to national standards

Table S3.1 Point source emissions to air – emission limits and monitoring requirements.						
Emission point ref. & location	Parameter	Source	Limit (including unit)	Reference period	Monitoring frequency	Monitoring standard(s) or method(s)
A1 and A2 (as shown on site plan in Schedule 7) ^{Note1}	Exhaust gas flow	Incineration exhausts gases via incineration plant stack	No limit set	-	Continuous	BS EN 16911-2
A1 and A2 (as shown on site plan in Schedule 7) ^{Note1}	Exhaust gas oxygen content	Incineration exhausts gases via incineration plant stack	No limit set	-	Continuous	EN 14181
A1 and A2 (as shown on site plan in Schedule 7) ^{Note1}	Exhaust gas water vapour content	Incineration exhausts gases via incineration plant stack	No limit set	-	Continuous	EN 14181
A1 and A2 (as shown on site plan in Schedule 7) ^{Note1}	Ammonia (NH ₃)	Incineration exhausts gases via incineration plant stack	15 mg/m ³	daily average	Continuous	EN 14181
A1 and A2 (as shown on site plan in Schedule 7) ^{Note1}	Nitrous oxide (N ₂ O)	Incineration exhausts gases via incineration plant stack	No limit set	½-hr average and daily average	Continuous	EN 14181
A1 and A2 (as shown on site plan in Schedule 7) ^{Note1}	Carbon dioxide	Incineration exhausts gases via incineration plant stack	No limit set	Continuous	Continuous	EN 14181

Table S3.1 Point source emissions to air – emission limits and monitoring requirements.						
Emission point ref. & location	Parameter	Source	Limit (including unit)	Reference period	Monitoring frequency	Monitoring standard(s) or method(s)
A1 and A2 (as shown on site plan in Schedule 7) ^{Note1}	Dioxins / furans (I-TEQ)	Incineration exhausts gases via incineration plant stack	0.06 ng/m ³ and 0.08 ng/m ³ if long term limit is specified by the Environment Agency in line with sampling protocol	periodic over minimum 6 hours, maximum 8 hour period and value over sampling period of 2 to 4 weeks for long term sampling	Quarterly in first year of operation then bi-annually and long term sampling if specified by the Environment Agency in line with sampling protocol	EN 1948 Parts 1, 2 and 3 and CEN TS 1948-5 if specified by the Environment Agency in line with sampling protocol
A1 and A2 (as shown on site plan in Schedule 7) ^{Note1}	Dioxin-like PCBs (WHO-TEQ Humans / Mammals, Fish, Birds)	Incineration exhausts gases via incineration plant stack	No limit set	periodic over minimum 6 hours, maximum 8 hour period	Quarterly in first year of operation then bi-annually	EN 1948 Parts 1, 2 and 4
A1 and A2 (as shown on site plan in Schedule 7) ^{Note1}	Dioxins / furans (WHO-TEQ Humans / Mammals, Fish, Birds)	Incineration exhausts gases via incineration plant stack	No limit set	periodic over minimum 6 hours, maximum 8 hour period	Quarterly in first year of operation then bi-annually	BS EN 1948 Parts 1, 2 and 3
A1 and A2 (as shown on site plan in Schedule 7) ^{Note1}	Polybrominated dibenzo-dioxins and furans	Incineration exhausts gases via incineration plant stack	No limit set	periodic over minimum 6 hours, maximum 8 hour period	Quarterly in first year of operation then bi-annually	Method based on procedural requirements of EN 1948

Table S3.1 Point source emissions to air – emission limits and monitoring requirements.						
Emission point ref. & location	Parameter	Source	Limit (including unit)	Reference period	Monitoring frequency	Monitoring standard(s) or method(s)
A1 and A2 (as shown on site plan in Schedule 7) ^{Note1}	Specific individual poly-cyclic aromatic hydrocarbons (PAHs), as specified in Schedule 6	Incineration exhausts gases via incineration plant stack	No limit set	periodic over minimum 6 hours, maximum 8 hour period	Quarterly in first year then annually	BS ISO 11338 Parts 1 and 2.
A3, A4 and A8 (as shown on site plan in Schedule 7)	Carbon monoxide	Emergency gas oil generator	No limit set	In line with web guide 'Monitoring stack emissions: low risk MCPs and specified generators' Published 16 February 2021 (formerly known as TGN M5)	First measurement within 4 months of first operation then every 1500 hours of operation or once every five years (whichever comes first)	In line with web guide 'Monitoring stack emissions: low risk MCPs and specified generators' Published 16 February 2021 (formerly known as TGN M5)
A5 & A6 (as shown on site plan in Schedule 7) ^{Note2}	Particulate matter	Carbon capture absorber tower stacks	30 mg/m ³	½-hr average	Continuous	EN 14181
A5 & A6 (as shown on site plan in Schedule 7) ^{Note2}	Particulate matter	Carbon capture absorber tower stacks	5 mg/m ³	daily average	Continuous	EN 14181
A5 & A6 (as shown on site plan in Schedule 7) ^{Note2}	Total Organic Carbon (TOC)	Carbon capture absorber tower stacks	20 mg/m ³	½-hr average	Continuous	EN 14181
A5 & A6 (as shown on site plan in Schedule 7) ^{Note2}	Total Organic Carbon (TOC)	Carbon capture absorber tower stacks	10 mg/m ³	daily average	Continuous	EN 14181

Table S3.1 Point source emissions to air – emission limits and monitoring requirements.						
Emission point ref. & location	Parameter	Source	Limit (including unit)	Reference period	Monitoring frequency	Monitoring standard(s) or method(s)
A5 & A6 (as shown on site plan in Schedule 7) ^{Note2}	Hydrogen chloride	Carbon capture absorber tower stacks	60 mg/m ³	½-hr average	Continuous	EN 14181
A5 & A6 (as shown on site plan in Schedule 7) ^{Note2}	Hydrogen chloride	Carbon capture absorber tower stacks	8 mg/m ³	daily average	Continuous	EN 14181
A5 & A6 (as shown on site plan in Schedule 7) ^{Note2}	Hydrogen fluoride	Carbon capture absorber tower stacks	1 mg/m ³	Average of three consecutive measurements of at least 30 minutes each	Quarterly in first year of operation then Bi-annually	CEN TS 17340
A5 & A6 (as shown on site plan in Schedule 7) ^{Note2}	Carbon monoxide	Carbon capture absorber tower stacks	150 mg/m ³	95% of all 10-minute averages in any 24-hour period	Continuous	EN 14181
A5 & A6 (as shown on site plan in Schedule 7) ^{Note2}	Carbon monoxide	Carbon capture absorber tower stacks	50 mg/m ³	daily average	Continuous	EN 14181
A5 & A6 (as shown on site plan in Schedule 7) ^{Note2}	Sulphur dioxide	Carbon capture absorber tower stacks	200 mg/m ³	½-hr average	Continuous	EN 14181
A5 & A6 (as shown on site plan in Schedule 7) ^{Note2}	Sulphur dioxide	Carbon capture absorber tower stacks	40 mg/m ³	daily average	Continuous	EN 14181
A5 & A6 (as shown on site plan in Schedule 7) ^{Note2}	Oxides of nitrogen (NO and NO ₂ expressed as NO ₂)	Carbon capture absorber tower stacks	400 mg/m ³	½-hr average	Continuous	EN 14181

Table S3.1 Point source emissions to air – emission limits and monitoring requirements.						
Emission point ref. & location	Parameter	Source	Limit (including unit)	Reference period	Monitoring frequency	Monitoring standard(s) or method(s)
A5 & A6 (as shown on site plan in Schedule 7) ^{Note2}	Oxides of nitrogen (NO and NO ₂ expressed as NO ₂)	Carbon capture absorber tower stacks	180 mg/m ³	daily average	Continuous	EN 14181
A5 & A6 (as shown on site plan in Schedule 7) ^{Note2}	Cadmium & thallium and their compounds (total)	Carbon capture absorber tower stacks	0.02 mg/m ³	Average of three consecutive measurements of at least 30 minutes each	Quarterly in first year of operation then bi-annually	BS EN 14385
A5 & A6 (as shown on site plan in Schedule 7) ^{Note2}	Mercury and its compounds	Carbon capture absorber tower stacks	0.02 mg/m ³ Limit does not apply if continuous monitoring has been specified by the Environment Agency	Average of three consecutive measurements of at least 30 minutes each	Quarterly in first year of operation then bi-annually Not required if continuous monitoring has been specified by the Environment Agency	BS EN 13211
A5 & A6 (as shown on site plan in Schedule 7) ^{Note2}	Mercury and its compounds	Carbon capture absorber tower stacks	0.02 mg/m ³	Daily average	Continuous Not required unless continuous monitoring has been specified by the Environment Agency in line with sampling protocol	EN 14181

Table S3.1 Point source emissions to air – emission limits and monitoring requirements.						
Emission point ref. & location	Parameter	Source	Limit (including unit)	Reference period	Monitoring frequency	Monitoring standard(s) or method(s)
A5 & A6 (as shown on site plan in Schedule 7) ^{Note2}	Sb, As, Pb, Cr, Co, Cu, Mn, Ni and V and their compounds (total)	Carbon capture absorber tower stacks	0.3 mg/m ³	Average of three consecutive measurements of at least 30 minutes each	Quarterly in first year of operation then bi-annually	BS EN 14385
A5 & A6 (as shown on site plan in Schedule 7)	Exhaust gas temperature	Carbon capture absorber tower stacks	No limit set	-	Continuous	Traceable to national standards
A5 & A6 (as shown on site plan in Schedule 7)	Exhaust gas pressure	Carbon capture absorber tower stacks	No limit set	-	Continuous	Traceable to national standards
A5 & A6 (as shown on site plan in Schedule 7)	Exhaust gas flow	Carbon capture absorber tower stacks	No limit set	-	Continuous	BS EN 16911-2
A5 & A6 (as shown on site plan in Schedule 7)	Exhaust gas oxygen content	Carbon capture absorber tower stacks	No limit set	-	Continuous	EN 14181
A5 & A6 (as shown on site plan in Schedule 7)	Exhaust gas water vapour content	Carbon capture absorber tower stacks	No limit set	-	Continuous	EN 14181
A5 & A6 (as shown on site plan in Schedule 7) ^{Note3}	Ammonia (NH ₃)	Carbon capture absorber tower stacks	15 mg/m ³	daily average	Continuous	EN 14181
A5 & A6 (as shown on site plan in Schedule 7) ^{Note2}	Nitrous oxide (N ₂ O)	Carbon capture absorber tower stacks	No limit set	½-hr average and daily average	Continuous	EN 14181

Table S3.1 Point source emissions to air – emission limits and monitoring requirements.						
Emission point ref. & location	Parameter	Source	Limit (including unit)	Reference period	Monitoring frequency	Monitoring standard(s) or method(s)
A5 & A6 (as shown on site plan in Schedule 7) ^{Note3}	Carbon dioxide	Carbon capture absorber tower stacks	No limit set	Continuous	Continuous	EN 14181
A5 & A6 (as shown on site plan in Schedule 7) ^{Note2}	Dioxins / furans (I-TEQ)	Carbon capture absorber tower stacks	0.06 ng/m ³ and 0.08 ng/m ³ if long term limit is specified by the Environment Agency in line with sampling protocol	periodic over minimum 6 hours, maximum 8 hour period and value over sampling period of 2 to 4 weeks for long term sampling	Quarterly in first year of operation then bi-annually and long term sampling if specified by the Environment Agency in line with sampling protocol	EN 1948 Parts 1, 2 and 3 and CEN TS 1948-5 if specified by the Environment Agency in line with sampling protocol
A5 & A6 (as shown on site plan in Schedule 7) ^{Note2}	Dioxin-like PCBs (WHO-TEQ Humans / Mammals, Fish, Birds)	Carbon capture absorber tower stacks	No limit set	periodic over minimum 6 hours, maximum 8 hour period	Quarterly in first year of operation then bi-annually	EN 1948 Parts 1, 2 and 4
A5 & A6 (as shown on site plan in Schedule 7) ^{Note2}	Dioxins / furans (WHO-TEQ Humans / Mammals, Fish, Birds)	Carbon capture absorber tower stacks	No limit set	periodic over minimum 6 hours, maximum 8 hour period	Quarterly in first year of operation then bi-annually	BS EN 1948 Parts 1, 2 and 3
A5 & A6 (as shown on site plan in Schedule 7) ^{Note2}	Polybrominated dibenzo-dioxins and furans	Carbon capture absorber tower stacks	No limit set	periodic over minimum 6 hours, maximum 8 hour period	Quarterly in first year of operation then bi-annually	Method based on procedural requirements of EN 1948

Table S3.1 Point source emissions to air – emission limits and monitoring requirements.						
Emission point ref. & location	Parameter	Source	Limit (including unit)	Reference period	Monitoring frequency	Monitoring standard(s) or method(s)
A5 & A6 (as shown on site plan in Schedule 7) ^{Note2}	Specific individual poly-cyclic aromatic hydrocarbons (PAHs), as specified in Schedule 6.	Carbon capture absorber tower stacks	No limit set	periodic over minimum 6 hours, maximum 8 hour period	Quarterly in first year then annually	BS ISO 11338 Parts 1 and 2.
A5 & A6 (as shown on site plan in Schedule 7) ^{Note3}	Acetaldehyde	Carbon capture absorber tower stacks	5 mg/m ³	Periodic average over the sampling period	Monthly until the requirements of IC19 have been agreed, then as agreed with the Environment Agency	Isokinetic based on CEN TS 17638
A5 & A6 (as shown on site plan in Schedule 7) ^{Note3}	Formaldehyde	Carbon capture absorber tower stacks	5 mg/m ³	Periodic average over the sampling period	Monthly until the requirements of IC19 have been agreed, then as agreed with the Environment Agency	Isokinetic CEN TS 17638, or as agreed in writing with the Environment Agency
A5 & A6 (as shown on site plan in Schedule 7) ^{Note3}	Total Amines (expressed as MEA) CAS No 141-43-5	Carbon capture absorber tower stacks	5 mg/m ³	Periodic average over the sampling period	Monthly until the requirements of IC19 have been agreed, then as agreed with the Environment Agency	Isokinetic impinger method based on EN 14791 to be agreed with the Environment Agency in writing
A5 & A6 (as shown on site plan in Schedule 7) ^{Note3}	Total Nitrosamines expressed as N-nitrosodimethylamine (NDMA) CAS No 62-75-9	Carbon capture absorber tower stacks	0.002 mg/m ³	Periodic average over the sampling period	Monthly until the requirements of IC19 have been agreed, then as agreed with the Environment Agency	Isokinetic impinger method based on EN 14791 to be agreed with the Environment Agency in writing

Table S3.1 Point source emissions to air – emission limits and monitoring requirements.						
Emission point ref. & location	Parameter	Source	Limit (including unit)	Reference period	Monitoring frequency	Monitoring standard(s) or method(s)
A5 & A6 (as shown on site plan in Schedule 7) ^{Note3}	Monoethanolamine (MEA) CAS No 141-43-5	Carbon capture absorber tower stacks	No limit set	Periodic average over the sampling period	Monthly until the requirements of IC19 have been agreed, then as agreed with the Environment Agency	Isokinetic impinger method based on EN 14791 to be agreed with the Environment Agency in writing
A5 & A6 (as shown on site plan in Schedule 7) ^{Note3}	Ethylamine (EA) CAS No 75-04-7	Carbon capture absorber tower stacks	No limit set	Periodic average over the sampling period	Monthly until the requirements of IC19 have been agreed, then as agreed with the Environment Agency	Isokinetic impinger method based on EN 14791 to be agreed with the Environment Agency in writing
A5 & A6 (as shown on site plan in Schedule 7) ^{Note3}	Methyl diethanolamine (MDEA) CAS No 105-59-9	Carbon capture absorber tower stacks	No limit set	Periodic average over the sampling period	Monthly until the requirements of IC19 have been agreed, then as agreed with the Environment Agency	Isokinetic impinger method based on EN 14791 to be agreed with the Environment Agency in writing
A5 & A6 (as shown on site plan in Schedule 7) ^{Note3}	Diethanolamine (DEA) CAS No 111-42-2	Carbon capture absorber tower stacks	No limit set	Periodic average over the sampling period	Monthly until the requirements of IC19 have been agreed, then as agreed with the Environment Agency	Isokinetic impinger method based on EN 14791 to be agreed with the Environment Agency in writing
A5 & A6 (as shown on site plan in Schedule 7) ^{Note3}	Dimethylamine (DMA) CAS No 124-40-3	Carbon capture absorber tower stacks	No limit set	Periodic average over the sampling period	Monthly until the requirements of IC19 have been agreed, then as agreed with the Environment Agency	Isokinetic impinger method based on EN 14791 to be agreed with the Environment Agency in writing

Table S3.1 Point source emissions to air – emission limits and monitoring requirements.						
Emission point ref. & location	Parameter	Source	Limit (including unit)	Reference period	Monitoring frequency	Monitoring standard(s) or method(s)
A5 & A6 (as shown on site plan in Schedule 7) ^{Note3}	Morpholine (MOR) CAS No 110-91-8	Carbon capture absorber tower stacks	No limit set	Periodic average over the sampling period	Monthly until the requirements of IC19 have been agreed, then as agreed with the Environment Agency	Isokinetic impinger method based on EN 14791 to be agreed with the Environment Agency in writing
A5 & A6 (as shown on site plan in Schedule 7) ^{Note3}	Monomethylamine (MMA) CAS No 74-89-5	Carbon capture absorber tower stacks	No limit set	Periodic average over the sampling period	Monthly until the requirements of IC19 have been agreed, then as agreed with the Environment Agency	Isokinetic impinger method based on EN 14791 to be agreed with the Environment Agency in writing
A5 & A6 (as shown on site plan in Schedule 7) ^{Note3}	2-(ethylamine) ethanol CAS No 110-73-6	Carbon capture absorber tower stacks	No limit set	Periodic average over the sampling period	Monthly until the requirements of IC19 have been agreed, then as agreed with the Environment Agency	Isokinetic impinger method based on EN 14791 to be agreed with the Environment Agency in writing
A5 & A6 (as shown on site plan in Schedule 7) ^{Note3}	N-nitrosodimethylamine (NDMA) CAS No 62-75-9	Carbon capture absorber tower stacks	No limit set	Periodic average over the sampling period	Monthly until the requirements of IC19 have been agreed, then as agreed with the Environment Agency	Isokinetic impinger method based on EN 14791 to be agreed with the Environment Agency in writing
A5 & A6 (as shown on site plan in Schedule 7) ^{Note3}	N-nitrosomorpholine CAS No 59-89-2	Carbon capture absorber tower stacks	No limit set	Periodic average over the sampling period	Monthly until the requirements of IC19 have been agreed, then as agreed with the Environment Agency	Isokinetic impinger method based on EN 14791 to be agreed with the Environment Agency in writing

Table S3.1 Point source emissions to air – emission limits and monitoring requirements.						
Emission point ref. & location	Parameter	Source	Limit (including unit)	Reference period	Monitoring frequency	Monitoring standard(s) or method(s)
A5 & A6 (as shown on site plan in Schedule 7) ^{Note3}	N-nitrosomethylethylamine CAS No 10595-95-6	Carbon capture absorber tower stacks	No limit set	Periodic average over the sampling period	Monthly until the requirements of IC19 have been agreed, then as agreed with the Environment Agency	Isokinetic impinger method based on EN 14791 to be agreed with the Environment Agency in writing
A5 & A6 (as shown on site plan in Schedule 7) ^{Note3}	N-nitrosodiethylamine CAS No 55-18-5	Carbon capture absorber tower stacks	No limit set	Periodic average over the sampling period	Monthly until the requirements of IC19 have been agreed, then as agreed with the Environment Agency	Isokinetic impinger method based on EN 14791 to be agreed with the Environment Agency in writing
A5 & A6 (as shown on site plan in Schedule 7) ^{Note3}	N-nitrosodiisopropylamine CAS No 601-77-4	Carbon capture absorber tower stacks	No limit set	Periodic average over the sampling period	Monthly until the requirements of IC19 have been agreed, then as agreed with the Environment Agency	Isokinetic impinger method based on EN 14791 to be agreed with the Environment Agency in writing
A5 & A6 (as shown on site plan in Schedule 7) ^{Note3}	N-nitrosodipropylamine CAS No 621-64-7	Carbon capture absorber tower stacks	No Limit set	Periodic average over the sampling period	Monthly until the requirements of IC19 have been agreed, then as agreed with the Environment Agency	Isokinetic impinger method based on EN 14791 to be agreed with the Environment Agency in writing
A5 & A6 (as shown on site plan in Schedule 7) ^{Note3}	N-nitrosodibutylamine CAS No 924-16-3	Carbon capture absorber tower stacks	No limit set	Periodic average over the sampling period	Monthly until the requirements of IC19 have been agreed, then as agreed with the Environment Agency	Isokinetic impinger method based on EN 14791 to be agreed with the Environment Agency in writing

Table S3.1 Point source emissions to air – emission limits and monitoring requirements.						
Emission point ref. & location	Parameter	Source	Limit (including unit)	Reference period	Monitoring frequency	Monitoring standard(s) or method(s)
A5 & A6 (as shown on site plan in Schedule 7) ^{Note3}	N-nitrosodibenzylamine CAS No 5336-53-8	Carbon capture absorber tower stacks	No limit set	Periodic average over the sampling period	Monthly until the requirements of IC19 have been agreed, then as agreed with the Environment Agency	Isokinetic impinger method based on EN 14791 to be agreed with the Environment Agency in writing
A5 & A6 (as shown on site plan in Schedule 7) ^{Note3}	N-(2-hydroxyethyl)ethylene diamine CAS No. 111-41-1	Carbon capture absorber tower stacks	No limit set	Periodic average over the sampling period	Monthly until the requirements of IC19 have been agreed, then as agreed with the Environment Agency	Isokinetic impinger method based on EN 14791 to be agreed with the Environment Agency in writing
A5 & A6 (as shown on site plan in Schedule 7) ^{Note3}	N-nitrosomorpholine CAS No. 59-89-2	Carbon capture absorber tower stacks	No limit set	Periodic average over the sampling period	Monthly until the requirements of IC19 have been agreed, then as agreed with the Environment Agency	Isokinetic impinger method based on EN 14791 to be agreed with the Environment Agency in writing
A5 & A6 (as shown on site plan in Schedule 7) ^{Note3}	N-nitrosodiethanolamine (NDELA) CAS No. 1116-54-7	Carbon capture absorber tower stacks	No limit set	Periodic average over the sampling period	Monthly until the requirements of IC19 have been agreed, then as agreed with the Environment Agency	Isokinetic impinger method based on EN 14791 to be agreed with the Environment Agency in writing
A5 & A6 (as shown on site plan in Schedule 7) ^{Note3}	N-nitrosomethylethylamine CAS No. 10595-95-6	Carbon capture absorber tower stacks	No limit set	Periodic average over the sampling period	Monthly until the requirements of IC19 have been agreed, then as agreed with the Environment Agency	Isokinetic impinger method based on EN 14791 to be agreed with the Environment Agency in writing

Table S3.1 Point source emissions to air – emission limits and monitoring requirements.						
Emission point ref. & location	Parameter	Source	Limit (including unit)	Reference period	Monitoring frequency	Monitoring standard(s) or method(s)
A5 & A6 (as shown on site plan in Schedule 7) ^{Note3}	N-nitrosopyrrolidine CAS No. 930-55-2	Carbon capture absorber tower stacks	No limit set	Periodic average over the sampling period	Monthly until the requirements of IC19 have been agreed, then as agreed with the Environment Agency	Isokinetic impinger method based on EN 14791 to be agreed with the Environment Agency in writing
A5 & A6 (as shown on site plan in Schedule 7) ^{Note3}	N-nitrosodibenzylamine CAS No. 5336-53-8	Carbon capture absorber tower stacks	No limit set	Periodic average over the sampling period	Monthly until the requirements of IC19 have been agreed, then as agreed with the Environment Agency	Isokinetic impinger method based on EN 14791 to be agreed with the Environment Agency in writing
A5 & A6 (as shown on site plan in Schedule 7) ^{Note3}	As required by the Method Implementation Document for BS EN 15259 (Homogeneity test)	Carbon capture absorber tower stacks	No limit set	-	Pre-operation and when there is a significant operational change	BS EN 15259
A7 (as shown on site plan in Schedule 7)	Carbon dioxide	Carbon dioxide vent stack	No limit set	-	-	-
Note 1: Prior to the carbon capture plant coming into operation the monitoring point for emissions from A1 and A2 will be moved from the incinerator stacks to the duct between the incineration plant and the carbon capture plant. The revised monitoring points will be agreed in writing with the Environment Agency in accordance with POM8 in Table S1.4B of this permit. Note 2: Monitoring will be done at monitoring points located between the incineration plant and the carbon capture plant as agreed in writing with the Environment Agency in accordance with POM8 in Table S1.4B of this permit. Note 3: Reference conditions for these parameters are as follows: the concentration in dry air at a temperature of 273K, at a pressure of 101.3 kPa and with an oxygen content of 11% dry.						

Table S3.1(a) Point source emissions to air during abnormal operation of incineration plant – emission limits and monitoring requirements						
Emission point ref. & location	Parameter	Source	Limit (including unit)	Reference period	Monitoring frequency	Monitoring standard or method
A1 and A2 (as shown on site plan in Schedule 7)	Particulate matter	Incineration exhausts gases	150 mg/m ³	½-hr average	Continuous	EN 14181 or alternative surrogate as agreed in writing with the environment agency during failure of the continuous emission monitor
A1 and A2 (as shown on site plan in Schedule 7)	Total Organic Carbon (TOC)	Incineration exhausts gases	20 mg/m ³	½-hr average	Continuous	EN 14181 or alternative surrogate as agreed in writing with the environment agency during failure of the continuous emission monitor
A1 and A2 (as shown on site plan in Schedule 7)	Carbon monoxide	Incineration exhausts gases	150 mg/m ³	95% of all 10-minute averages in any 24-hour period	Continuous	EN 14181 or alternative surrogate as agreed in writing with the environment agency during failure of the continuous emission monitor

Table S3.2 Point source emissions to water (other than sewer) and land – emission limits and monitoring requirements						
Emission point ref. & location	Source	Parameter	Limit (incl. unit)	Reference Period	Monitoring frequency	Monitoring standard or method
W1, W2 and W3 as identified on the site plan in Schedule 7	Uncontaminated surface water discharging to Manchester Ship Canal via the East Central Drain.	No parameters set	No limit set	--	--	--

Table S3.3 Process monitoring requirements					
Emission point reference or source or description of point of measurement	Parameter	Monitoring frequency	Monitoring standard or method	Other specifications	
As identified in the Application	Wind Speed and Direction	Continuous	Anemometer		
Location close to the Combustion Chamber inner wall or as identified and justified in Application	Temperature (° C)	Continuous	Traceable to national standards	As agreed in writing with the Agency	
Incineration plant	Gross electrical efficiency	within 6 months of any modification that significantly affects energy efficiency	Performance test at full load or other method as agreed in writing with the Environment Agency		
Incineration plant with post combustion carbon capture	Gross energy efficiency	Within 6 months of first operation of the carbon capture plant and then within 6 months of any modification that significantly affects energy efficiency	Performance test at full load or other method as agreed in writing with the Environment Agency		
Absorber amine solvent quality, activity AR2 in table S1.1	Percent active amine (MEA)	Weekly, or otherwise agreed in writing with the Environment Agency	As agreed in writing with the Environment Agency in accordance with POM5 in table S1.4B		
Absorber amine solvent quality, activity AR2 in table S1.1	Carbon dioxide loading (rich amine)	Weekly, or otherwise agreed in writing with the Environment Agency	As agreed in writing with the Environment Agency in accordance with POM5 in table S1.4B		

Table S3.3 Process monitoring requirements				
Emission point reference or source or description of point of measurement	Parameter	Monitoring frequency	Monitoring standard or method	Other specifications
Absorber amine solvent quality, activity AR2 in table S1.1	Heat stable salts	Every day during the first month of operation then once per week, or otherwise agreed in writing with the Environment Agency	As agreed in writing with the Environment Agency in accordance with POM5 in table S1.4B	
Absorber amine solvent quality, activity AR2 in table S1.1	Soluble iron concentration – rich amine	Every day during the first month of operation then once per week, or otherwise agreed in writing with the Environment Agency	As agreed in writing with the Environment Agency in accordance with POM5 in table S1.4B	
Absorber amine solvent quality, activity AR2 in table S1.1	Soluble iron concentration – Lean amine following stripper	Once per week, or otherwise agreed in writing with the Environment Agency	As agreed in writing with the Environment Agency in accordance with POM5 in table S1.4B	
Absorber amine solvent quality, activity AR2 in table S1.1	Colour	Weekly, or otherwise agreed in writing with the Environment Agency	As agreed in writing with the Environment Agency in accordance with POM5 in table S1.4B	
Absorber amine solvent quality, activity AR2 in table S1.1	Degradation products – including but not limited to amines, nitrosamines, nitramines (in absorber amine prior to reclaiming and after reclaiming)	Monthly, or otherwise agreed in writing with the Environment Agency	BSEN ISO 10695, or otherwise agreed in writing with the Environment Agency	
Carbon capture performance	Carbon capture efficiency (%) during normal operation	Continuous	Calculation by method traceable to national standards compliant with UK ETS, to be agreed in writing with the Environment Agency as part of POM3 in Table S1.4B of this permit	Note 1

Table S3.3 Process monitoring requirements				
Emission point reference or source or description of point of measurement	Parameter	Monitoring frequency	Monitoring standard or method	Other specifications
Venting of CO ₂ from carbon capture plant – emission point A7	- Duration of event - Total mass of CO₂ emissions (tonnes / event)	Event specific, total annual	Calculation by method traceable to national standards compliant with UK ETS, to be agreed in writing with the Environment Agency as part of POM3 in Table S1.4B of this permit	The operator shall identify the root cause of the venting event and consider ways to prevent or reduce the frequency and duration of reoccurrence
Carbon dioxide metering package	Exported CO ₂ mass flow (tonnes/hour)	Continuous	Mass flow metering traceable to national standards compliant with UK ETS, to be agreed in writing with the Environment Agency as part of POM3 in table S1.4B of this permit	
Custody transfer point	Composition of exported CO ₂ , including but not limited to: - Water content - H₂ content	To be agreed in writing with the Environment Agency	By method traceable to national standards compliant with UK ETS, to be agreed in writing with the Environment Agency as part of POM3 in table S1.4B of this permit	CO ₂ transport and storage system specification
Note 1: Instantaneous and annual average Carbon Capture Efficiency to be monitored. Annual average Carbon Capture Efficiency to be averaged over 1 year of operations (from 1 st of January) during normal operation. Excluding periods of OTNOC. OTNOC includes venting of CO ₂ during periods of time when the CO ₂ transport and storage system is not available due to causes external to the operations of the installation; and periods of start-up and shut-down.				

Table S3.4 Residue quality					
Emission point reference or source or description of point of measurement	Parameter	Limit	Monitoring frequency	Monitoring standard or method ^{Note 1}	Other specifications
Bottom Ash from incineration lines	TOC or otherwise as agreed in writing with the Environment Agency	3% or otherwise as agreed in writing with the Environment Agency	Monthly in the first year of operation. Then Quarterly	EN 14899 and either EN 13137 or EN 15936 or otherwise as agreed in writing with the Environment Agency	Environment Agency Guidance, 'TGN M4 – Guidelines for Ash Sampling and Analysis'
Bottom Ash from incineration lines	Metals (Antimony, Cadmium, Thallium, Mercury, Lead, Chromium, Copper, Manganese, Nickel, Arsenic, Cobalt, Vanadium, Zinc) and their compounds, dioxins/furans and dioxin-like PCBs		Monthly in the first year of operation. Then Quarterly	Environment Agency Guidance, 'TGN M4 – Guidelines for Ash Sampling and Analysis'	
Bottom Ash from incineration lines	Total soluble fraction and metals (Antimony, Cadmium, Thallium, Mercury, Lead, Chromium, Copper, Manganese, Nickel, Arsenic, Cobalt, Vanadium, Zinc) soluble fractions		Before use of a new disposal or recycling route	Environment Agency Guidance, 'TGN M4 – Guidelines for Ash Sampling and Analysis'	
APC Residues from incineration lines	Metals (Antimony, Cadmium, Thallium, Mercury, Lead, Chromium, Copper, Manganese, Nickel, Arsenic, Cobalt, Vanadium, Zinc) and their compounds, dioxins/furans and dioxin-like PCBs		Monthly in the first year of operation. Then Quarterly	Environment Agency Guidance, 'TGN M4 – Guidelines for Ash Sampling and Analysis'	
APC Residues from incineration lines	Total soluble fraction and metals (Antimony, Cadmium, Thallium, Mercury, Lead, Chromium, Copper, Manganese, Nickel, Arsenic, Cobalt, Vanadium, Zinc) soluble fractions		Before use of a new disposal or recycling route	Environment Agency Guidance, 'TGN M4 – Guidelines for Ash Sampling and Analysis'	
Note 1 – or other standard as agreed in writing with the Environment Agency					

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 Parameters as required by condition 3.6.1	A1, A2, A5, A6	Quarterly	1 Jan, 1 Apr, 1 Jul and 1 Oct
	A3, A4, A8	After 1500 hours of operation or every 5 years, whichever comes first	1 Jan
CO ₂ venting - Number of events - Duration of events - Root cause analysis for each event and preventative / frequency reduction measures Total mass of CO ₂ emissions (tonnes / event)	A7	Annually	1 January
TOC or otherwise as agreed in writing with the Environment Agency Parameters as required by condition 3.6.1	Bottom Ash	Quarterly (but monthly for the first year of operation)	1 Jan, 1 Apr, 1 Jul and 1 Oct
Metals (Antimony, Cadmium, Thallium, Mercury, Lead, Chromium, Copper, Manganese, Nickel, Arsenic, Cobalt, Vanadium, Zinc) and their compounds, dioxins/furans and dioxin-like PCBs Parameters as required by condition 3.6.1	Bottom Ash	Quarterly (but monthly for the first year of operation)	1 Jan, 1 Apr, 1 Jul and 1 Oct
Total soluble fraction and metals (Antimony, Cadmium, Thallium, Mercury, Lead, Chromium, Copper, Manganese, Nickel, Arsenic, Cobalt, Vanadium, Zinc) soluble fractions Parameters as required by condition 3.6.1	Bottom Ash	Before use of a new disposal or recycling route	
Metals (Antimony, Cadmium, Thallium, Mercury, Lead, Chromium, Copper, Manganese, Nickel, Arsenic, Cobalt, Vanadium, Zinc) and their compounds, dioxins/furans and dioxin-like PCBs Parameters as required by condition 3.6.1	APC Residues	Quarterly (but monthly for the first year of operation)	1 Jan, 1 Apr, 1 Jul and 1 Oct
Total soluble fraction and metals (Antimony, Cadmium, Thallium, Mercury, Lead, Chromium, Copper, Manganese, Nickel, Arsenic, Cobalt, Vanadium, Zinc) soluble fractions Parameters as required by condition 3.6.1	APC Residues	Before use of a new disposal or recycling route	

Table S4.2: Annual production/treatment	
Parameter	Units
Total waste incinerated	tonnes
Electrical energy produced	KWh
Thermal energy produced e.g. steam for export	MWh
Electrical energy exported	KWh
Electrical energy used on installation	KWh
Waste heat utilised by the installation	KWh

Table S4.3 Performance parameters		
Parameter	Frequency of assessment	Units
Annual Report as required by condition 4.2.2	Annually	-
Electrical energy exported, imported and used at the installation	Annually	KWh / tonne of waste incinerated
Fuel oil consumption	Annually	Kg / tonne of waste incinerated
Mass of Bottom Ash exported	Annually	Kg / tonne of waste incinerated
Mass of APC residues exported	Annually	Kg / tonne of waste incinerated
Mass of Other solid residues exported	Annually	Kg / tonne of waste incinerated
SNCR reagent consumption	Annually	Kg / tonne of waste incinerated
Activated Carbon consumption	Annually	Kg / tonne of waste incinerated
Lime consumption	Annually	Kg / tonne of waste incinerated
Water consumption	Annually	Kg / tonne of waste incinerated
Periods of abnormal operation	Annually	No of occasions and cumulative hours for current calendar year for each line.
Efficiency of carbon dioxide capture (carbon capture plant) during normal operation	Annually	%
Total (thermal and electrical) energy use per tonne of carbon dioxide captured (carbon capture plant)	Annually	kW/tonne CO ₂ captured
Amine solvent usage	Annually	tonnes
Total CO ₂ captured	Annually	tonnes
Total CO ₂ vented to atmosphere	Annually	tonnes

Table S4.3 Performance parameters		
Parameter	Frequency of assessment	Units
Water consumption per unit carbon dioxide captured	Annually	m ³ /t

Table S4.4 Reporting forms		
Media/parameter	Reporting format	Date of form
Annual report required by condition 4.2.2	Annual performance report template	-
Emissions to air	Forms air 1-9 or other forms as agreed in writing by the Environment Agency	22/05/2023
Residue quality	Form residue 1 and 2 or other form as agreed in writing by the Environment Agency	22/05/2023
Other performance indicators	Form performance 1 or other form as agreed in writing by the Environment Agency	22/05/2023

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	
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 breach of permit conditions not related to limits	
To be notified within 24 hours of detection	
Condition breached	
Date, time and duration of breach	
Details of the permit breach i.e. what happened including impacts observed.	
Measures taken, or intended to be taken, to restore permit compliance.	

(d) 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

“abatement equipment” means that equipment dedicated to the removal of polluting substances from releases from the installation to air or water media.

“abnormal operation” means: any technically unavoidable stoppages, disturbances, or failures of the plant or the measurement devices. Abnormal operation starts as defined in condition 2.3.12 and ends as defined in condition 2.3.13. Abnormal operation is limited to 4 hours for a single occurrence and a total of 60 hours per year per line.

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

“APC residues” means air pollution control residues.

“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.

“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.

“BAT conclusions” means Commission Implementing Decision (EU) 2019/2010 of 12 November 2019 establishing the best available techniques (BAT) conclusions, under Directive 2010/75/EU of the European Parliament and of the Council, for Waste Incineration.

“bi-annually” means twice per year with at least five months between tests.

“bottom ash” means ash falling through the grate or transported by the grate.

“CEM” Continuous emission monitor.

“CEN” means Comité Européen de Normalisation.

“commissioning” for the carbon capture plant means testing of the carbon capture plant where flue gases from the incineration plant are directed to the absorber column.

“commissioning” for the incineration plant means testing of the new incineration plant that involves any operation of the furnace or as agreed with the Environment Agency.

“daily average emissions value” means the average of at least 43 valid half hourly averages or for CO the average of at least 43 valid half hourly averages or 129 valid 10 min averages.

“dioxin and furans” means polychlorinated dibenzo-p-dioxins and polychlorinated dibenzofurans.

“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.

“emissions to land” includes emissions to groundwater.

“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.

“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.

“gas oil” includes diesel and is defined in Article 3(19) of the MCPD.

“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.

“incineration line” means all of the incineration equipment related to a common discharge to air location.

“Industrial Emissions Directive” 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.

“ISO” means International Standards Organisation.

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

“List of Wastes” means the list of wastes established by Commission Decision 2000/532/EC replacing Decision 94/3/EC establishing a list of wastes pursuant to Article 1(a) of Council Directive 75/442/EEC on waste and Council Decision 94/904/EC establishing a list of hazardous waste pursuant to Article 1(4) of Council Directive 91/689/EEC on hazardous waste, as amended from time to time.

“LOI” means loss on ignition a technique used to determine the combustible material by heating the ash residue to a high temperature.

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

“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.

“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.

“PAH” means Poly-cyclic aromatic hydrocarbon, and comprises Anthanthrene, Benzo[a]anthracene, Benzo[b]fluoranthene, Benzo[k]fluoranthene, Benzo[b]naph(2,1-d)thiophene, Benzo[c]phenanthrene, Benzo[ghi]perylene, Benzo[a]pyrene, Cholanthrene, Chrysene, Cyclopenta[c,d]pyrene, Dibenzo[ah]anthracene, Dibenzo[a,i]pyrene Fluoranthene, Indo[1,2,3-cd]pyrene, Naphthalene.

“PCB” means Polychlorinated Biphenyl. Dioxin-like PCBs are the non-ortho and mono-ortho PCBs listed in the table below.

“Pests” means Birds, Vermin and Insects.

“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.

“start up” is any period, where the plant has been non-operational, until waste has been fed to the plant in a sufficient quantity to initiate steady-state conditions as described in the application or as agreed in writing with the Environment Agency.

“shut down” is any period where the plant is being returned to a non-operational state as described in the application or as agreed in writing with the Environment Agency.

“TOC” means Total Organic Carbon. In respect of releases to air, this means the gaseous and vaporous organic substances, expressed as TOC. In respect of Bottom Ash, this means the total carbon content of all organic species present in the ash (excluding carbon in elemental form).

“waste code” means the six digit code referable to a type of waste in accordance with the List of Wastes and in relation to hazardous waste, includes the asterisk.

“Waste Framework Directive” or “WFD” means Waste Framework Directive 2008/98/EC of the European Parliament and of the Council on waste

“year” means calendar year ending 31 December.

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:

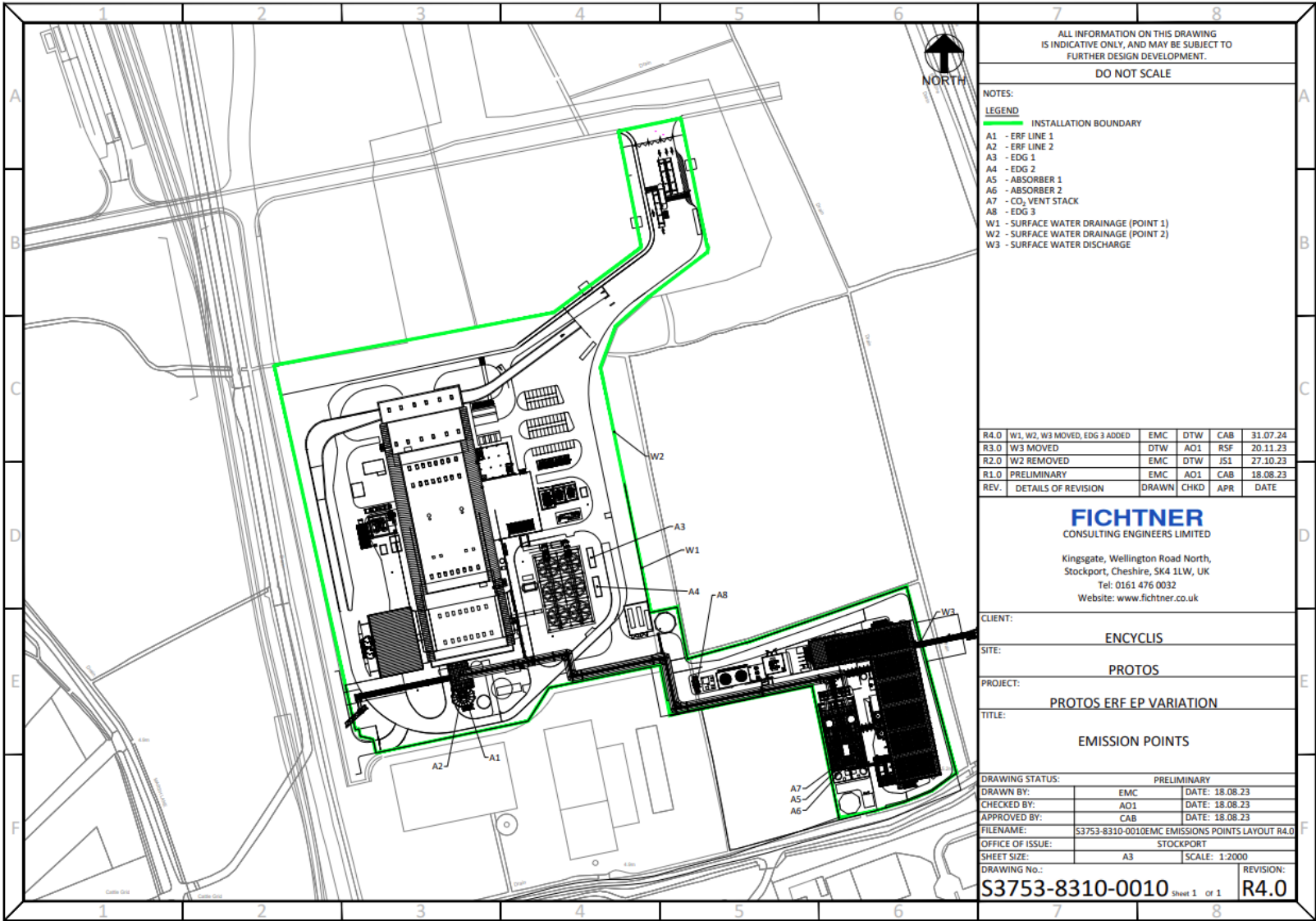
- (a) in relation to emissions from combustion processes, the concentration in dry air at a temperature of 273K, at a pressure of 101.3 kPa and with an oxygen content of 3% dry for liquid and gaseous fuels, 6% dry for solid fuels; and/or
- (b) in relation to emissions from non-combustion sources, the concentration at a temperature of 273K and at a pressure of 101.3 kPa, with no correction for water vapour content; and/or
- (c) in relation to gases from incineration plants other than those burning waste oil, the concentration in dry air at a temperature of 273K, at a pressure of 101.3 kPa and with an oxygen content of 11% dry.

For dioxins/furans and dioxin-like PCBs the determination of the toxic equivalence concentration (I-TEQ, & WHO-TEQ for dioxins/furans, WHO-TEQ for dioxin-like PCBs) stated as a release limit and/ or reporting requirement, the mass concentrations of the following congeners have to be multiplied with their respective toxic equivalence factors before summing. When reporting on measurements of dioxins/furans and dioxin-like PCBs, the toxic equivalence concentrations should be reported as a range based on: all congeners less than the detection limit assumed to be zero as a minimum, and all congeners less than the detection limit assumed to be at the detection limit as a maximum. However the minimum value should be used when assessing compliance with the emission limit value in table S3.1.

TEF schemes for dioxins and furans				
Congener	I-TEF	WHO-TEF		
	1990	2005	1997/8	
		Humans / Mammals	Fish	Birds
Dioxins				
2,3,7,8-TCDD	1	1	1	1
1,2,3,7,8-PeCDD	0.5	1	1	1
1,2,3,4,7,8-HxCDD	0.1	0.1	0.5	0.05
1,2,3,6,7,8-HxCDD	0.1	0.1	0.01	0.01
1,2,3,7,8,9-HxCDD	0.1	0.1	0.01	0.1
1,2,3,4,6,7,8-HpCDD	0.01	0.01	0.001	<0.001
OCDD	0.001	0.0003	-	-
Furans				
2,3,7,8-TCDF	0.1	0.1	0.05	1
1,2,3,7,8-PeCDF	0.05	0.03	0.05	0.1
2,3,4,7,8-PeCDF	0.5	0.3	0.5	1
1,2,3,4,7,8-HxCDF	0.1	0.1	0.1	0.1
1,2,3,7,8,9-HxCDF	0.1	0.1	0.1	0.1
1,2,3,6,7,8-HxCDF	0.1	0.1	0.1	0.1
2,3,4,6,7,8-HxCDF	0.1	0.1	0.1	0.1
1,2,3,4,6,7,8-HpCDF	0.01	0.01	0.01	0.01
1,2,3,4,7,8,9-HpCDF	0.01	0.01	0.01	0.01
OCDF	0.001	0.0003	0.0001	0.0001

TEF schemes for dioxin-like PCBs			
Congener	WHO-TEF		
	2005	1997/8	
	Humans / mammals	Fish	Birds
Non-ortho PCBs			
3,4,4',5-TCB (81)	0.0001	0.0005	0.1
3,3',4,4'-TCB (77)	0.0003	0.0001	0.05
3,3',4,4',5 - PeCB (126)	0.1	0.005	0.1
3,3',4,4',5,5'-HxCB(169)	0.03	0.00005	0.001
Mono-ortho PCBs			
2,3,3',4,4'-PeCB (105)	0.00003	<0.000005	0.0001
2,3,4,4',5-PeCB (114)	0.00003	<0.000005	0.0001
2,3',4,4',5-PeCB (118)	0.00003	<0.000005	0.00001
2',3,4,4',5-PeCB (123)	0.00003	<0.000005	0.00001
2,3,3',4,4',5-HxCB (156)	0.00003	<0.000005	0.0001
2,3,3',4,4',5'-HxCB (157)	0.00003	<0.000005	0.0001
2,3',4,4',5,5'-HxCB (167)	0.00003	<0.000005	0.00001
2,3,3',4,4',5,5'-HpCB (189)	0.00003	<0.000005	0.00001

Schedule 7 – Site plan



END OF PERMIT