Determination of an Application for an Environmental Permit under the Environmental Permitting (England & Wales) Regulations 2016

Decision document recording our decision-making process

The Permit Number is: EPR/CP3735RL/A001
The Applicant/Operator is: Rebellion Biomass LLP
The Installation is located at: Meriden Quarry, Cornets End Lane, Coventry, CV7 7LG

What this document is about

This is a decision document, which accompanies a permit.

It explains how we have considered the Applicant's Application, and why we have included the specific conditions in the permit we are issuing to the Applicant. It is our record of our decision-making process, to show how we have taken into account all relevant factors in reaching our position. Unless the document explains otherwise, we have accepted the Applicant's proposals.

We try to explain our decision as accurately, comprehensively and plainly as possible. Achieving all three objectives is not always easy, and we would welcome any feedback as to how we might improve our decision documents in future. A lot of technical terms and acronyms are inevitable in a document of this nature: we provide a glossary of acronyms near the front of the document, for ease of reference.

Preliminary information and use of terms

We gave the application the reference number EPR/CP3735RL/A001. We refer to the application as "the **Application**" in this document in order to be consistent.

The number we have given to the permit is EPR/CP3735RL. We refer to the permit as "the **Permit**" in this document.

The Application was duly made on 22/12/2018.

The Applicant is Rebellion Biomass LLP. We refer Rebellion Biomass LLP as "the **Applicant**" in this document. Where we are talking about what would happen after the Permit is granted (if that is our final decision), we call Rebellion Biomass LLP "the **Operator**".

Rebellion Biomass LLP's facility is located at Meriden Quarry. We refer to this as "the **Installation**" in this document.

How this document is structured

Glossary of acronyms used in this document

(Please note that this glossary is standard for our decision documents and therefore not all these acronyms are necessarily used in this document.)

AAD	Ambient Air Directive (2008/50/EC)
APC	Air Pollution Control
AQS	Air Quality Stratergy
BAT	Best Available Technique(s)
BAT-AEL	BAT Associated Emission Level
BREF	BAT Reference Note
CEM	Continuous emissions monitor
CFD	Computerised fluid dynamics
CHP	Combined heat and power
COMEAP	Committee on the Medical Effects of Air Pollutants
CROW	Countryside and rights of way Act 2000
CV	Calorific value
DAA	Directly associated activity – Additional activities necessary to be carried out to allow the principal activity to be carried out
DD	Decision document
EAL	Environmental assessment level
EIAD	Environmental Impact Assessment Directive (85/337/EEC)
ELV	Emission limit value
EMAS	EU Eco Management and Audit Scheme
EMS	Environmental Management System
EPR	Environmental Permitting (England and Wales) Regulations 2016 (SI 2016 No. 1154) as amended
ES	Environmental standard
EWC	European waste catalogue
FSA	Food Standards Agency
GWP	Global Warming Potential
HHRAP	Human Health Risk Assessment Protocol
HPA	Health Protection Agency (now PHE – Public Health England)
HRA	Human Rights Act 1998
HW	Hazardous waste
HWI	Hazardous waste incinerator
IBA	Incinerator Bottom Ash
IED	Industrial Emissions Directive (2010/75/EU)
IPPCD	Integrated Pollution Prevention and Control Directive (2008/1/EC) – now superseded by IED
I-TEF	Toxic Equivalent Factors set out in Annex VI Part 2 of IED
I-TEQ	Toxic Equivalent Quotient calculated using I-TEF
LCV	Lower calorific value – also termed net calorific value
LfD	Landfill Directive (1999/31/EC)
LADPH	Local Authority Director(s) of Public Health

LOI	Loss on Ignition
MBT	Mechanical biological treatment
MSW	Municipal Solid Waste
MWI	Municipal waste incinerator
NOx	Oxides of nitrogen (NO plus NO_2 expressed as NO_2)
Opra	Operator Performance Risk Appraisal
PAH	Polycyclic aromatic hydrocarbons
PC	Process Contribution
PCB	Polychlorinated biphenyls
PEC	Predicted Environmental Concentration
PHE	Public Health England
POP(s)	Persistent organic pollutant(s)
PPS	Public participation statement
PR	Public register
PXDD	Poly-halogenated di-benzo-p-dioxins
PXB	Poly-halogenated biphenyls
PXDF	Poly-halogenated di-benzo furans
RDF	Refuse derived fuel
RGS	Regulatory Guidance Series
SAC	Special Area of Conservation
SCR	Selective catalytic reduction
SGN	Sector guidance note
SHPI(s)	Site(s) of High Public Interest
SNCR	Selective non-catalytic reduction
SPA(s)	Special Protection Area(s)
SS	Sewage sludge
SSSI(s)	Site(s) of Special Scientific Interest
SWMA	Specified waste management activity
TDI	Tolerable daily intake
TEF	Toxic Equivalent Factors
TGN	Technical guidance note
TOC	Total Organic Carbon
UHV	Upper heating value –also termed gross calorific value
UN_ECE	United Nations Environmental Commission for Europe
US EPA	United States Environmental Protection Agency
WFD	Waste Framework Directive (2008/98/EC)
WHO	World Health Organisation
WID	Waste Incineration Directive (2000/76/EC) – now superseded by IED

1. Our decision

We have decided to grant the Permit to the Applicant. This will allow them to operate the Installation, subject to the conditions in the Permit.

We consider that, in reaching that decision, we have taken into account all relevant considerations and legal requirements and that the permit will ensure that a high level of protection is provided for the environment and human health.

This Application is to operate an installation which is subject principally to the Industrial Emissions Directive (IED).

The Permit contains many conditions taken from our standard Environmental Permit template including the relevant Annexes. We developed these conditions in consultation with industry, having regard to the legal requirements of the Environmental Permitting Regulations and other relevant legislation. This document does not therefore include an explanation for these standard conditions. Where they are included in the permit, we have considered the Application and accepted the details are sufficient and satisfactory to make the standard condition appropriate. This document does, however, provide an explanation of our use of "tailor-made" or installation-specific conditions, or where our Permit template provides two or more options.

2. How we reached our decision

2.1. Receipt of application

The Application was duly made on 22/12/2018. This means we considered it was in the correct form and contained sufficient information for us to begin our determination but not that it necessarily contained all the information we would need to complete that determination: see below.

The Applicant made no claim for commercial confidentiality. We have not received any information in relation to the Application that appears to be confidential in relation to any party.

2.2. Consultation on the Application

We advertised the Application by a notice placed on our website, which contained all the information required by the IED, including telling people where and when they could see a copy of the Application.

We sent copies of the Application to the following bodies, which includes those with whom we have "Working Together Agreements":

- West Midlands Fire and Rescue Service
- Health and Safety Executive
- Public Health England - Birmingham
- Director of Public Health – Solihull Borough Council
- Solihull Metropolitan Borough Council Environmental Health
- Solihull Metropolitan Borough Council Planning
- Food Standards Agency
- National Grid
- Severn Trent Water

These are bodies whose expertise, democratic accountability and/or local knowledge make it appropriate for us to seek their views directly.

2.3. Requests for Further Information

Although we were able to consider the Application duly made, we did in fact need more information in order to determine it, and issued an information notice on 3 April 2018. A copy of the information notice and the response to it, dated 14 May 2018, were placed on our public register.

3. Legal framework

The Permit is granted, under Regulation 13 of the EPR. The Environmental Permitting regime is a legal vehicle which delivers most of the relevant legal requirements for activities falling within its scope. In particular, the regulated facility is:

- a *waste co-incineration plant* as described by the IED;
- an *operation* covered by the WFD, and
- subject to aspects of other relevant legislation which also have to be addressed.

We address some of the major legal requirements directly where relevant in the body of this document. Other requirements are covered in a section towards the end of this document.

We consider that, in granting the Permit, it will ensure that the operation of the Installation complies with all relevant legal requirements and that a high level of protection will be delivered for the environment and human health.

We explain how we have addressed specific statutory requirements more fully in the rest of this document.

4. The Installation

4.1. Description of the Installation and related issues

4.1.1. The permitted activities

The Installation is subject to the EPR because it carries out an activity listed in Part 1 of Schedule 1 to the EPR:

- 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.

The IED definition of "waste incineration plants" and "waste co-incineration plants" says that it includes:

> *"all incineration lines or co-incineration lines, waste reception, storage, on-site pre-treatment facilities, waste, fuel and air supply systems, boilers, facilities for the treatment of waste gases, on-site facilities for treatment or storage of residues and waste water, stacks, devices for controlling incineration or co-incineration operations, recording and monitoring incineration or co-incineration conditions."*

Many activities which would normally be categorised as "directly associated activities" for EPR purposes (see below), such as air pollution control plant, (including storage and preparation of treatment chemicals), and the ash storage, are therefore included in the listed activity description.

Electrical generation and surface water management are the only directly associated activities.

4.1.2. The site

The site is located at Meriden Quarry, Cornets End Lane, Coventry, CV7 7LG. It is centred at SP2305281104. The site is located approximately 1.6km to the south west of the village of Meriden, 5.3km west of the outskirts of Coventry, 7.8km to the east of Solihull and 1km south east of the junction with the A452. The site is situated within an area subject to sand and gravel extraction, together with agricultural land and a Golf Course.

To the north and east of the site is an operational quarry that is accessed along a road immediately adjacent to the site's north western boundary. Quarry buildings are located to the north west of the site at distances of approximately 40m and 80m. A large one storey office building is located immediately to the west of the south western corner of the site. An operational quarry, together with man-made lakes, occupies the land to the south of the site, on the opposite side of Cornets End Lane.

The nearest residential properties are Keepers Cottage at a distance of approximately 125m to the east, Cornets End Farm approximately 315m to the south east and Hornbrook Farm 530m to the west. The remainder of the surrounding area is occupied predominantly by agricultural land. There are two Sites of Special Scientific Interest, four Local Wildlife Sites and five Ancient Woodlands within 2km of the site. There are no other designated sites identified.

These receptors have been assessed as part of the application.

The Applicant submitted a plan which we consider is satisfactory, showing the site of the Installation and its extent. A plan is included in Schedule 7 to the Permit, and the Operator is required to carry on the permitted activities within the site boundary.

Further information on the site is addressed below at 4.2.

4.1.3. What the installation does

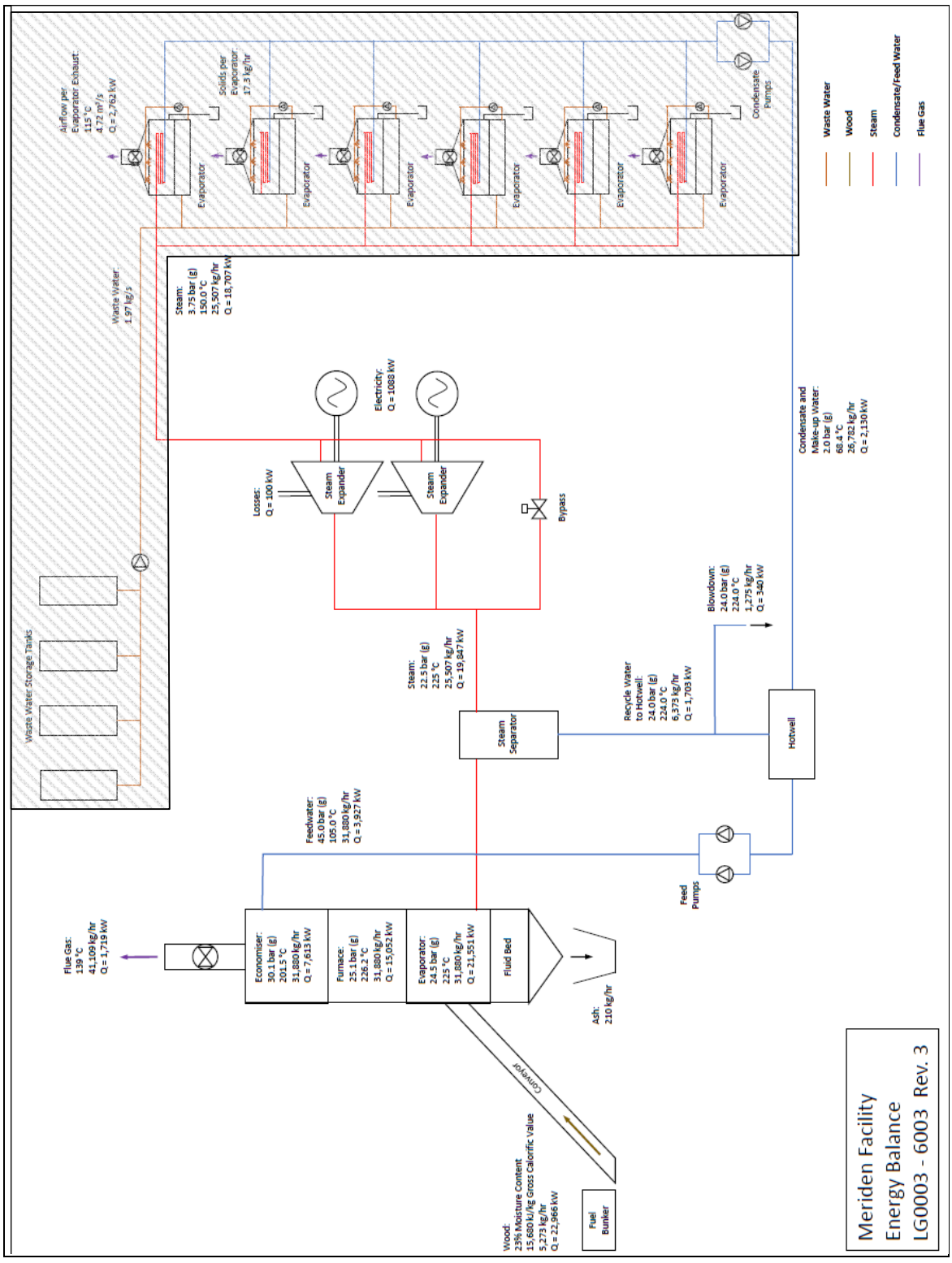
The Applicant has described the facility as a biomass energy facility. Our view is that for the purposes of IED (in particular Chapter IV) and EPR, the installation is a waste co-incineration plant because:

Notwithstanding the fact that waste will be thermally treated by the process; the process is never the less 'co-incineration' because it is considered that the main purpose of this plant is the generation of energy for use with in the adjacent waste water treatment plant operated by Astwood Energy Limited under permit EPR/ZP3237YL.

The key features of the Installation can be summarised in the table below.

Waste throughput, Tonnes/line	50,400 tonnes/annum 6 tonnes/hour
Waste processed	Waste Wood (grade B & C)
Number of lines	1
Furnace technology	Fluidised bed combustion
Auxiliary Fuel	Gas oil
Acid gas abatement	Dry - Sodium bicarbonate
NOx abatement	SNCR - Urea
Annual reagent consumption	Auxiliary Fuel: 60,000 litres Sodium Bicarbonate: 486 tonnes Urea: 13,356 litres Powdered Activated carbon: 13 tonnes
Flue gas recirculation	Yes
Dioxin abatement	Activated carbon
Stack	423026, 281084, height: 23.5 m, diameter: 0.96 m
Flue gas	Flow: 10.4 Nm^3/s Temperature: 150°C (423 K) Velocity: 15.62 m/s
Electricity generated	1.088 MWe 9,139 MWh (based on 8,400 hours of operation per annum)
Electricity exported	0.538 MWe 4,519 MWh
Steam conditions	Temperature: 225 °C Pressure: 22.5 bar
Waste heat use	18.707 MW of low grade waste heat is exported for use with in the adjacent waste water treatment plant operated under permit EPR/ZP3237YL.

The schematic below shows the process layout.



Grey hashed area part of installation but subject to separate permit.

4.1.4. Key issues in the determination

The key issues arising during this determination were emissions to air and we therefore describe how we determined these issues in most detail in this document.

4.2. The site and its protection

4.2.1. Site setting, layout and history

The site location and setting is described in section 4.1.2 above.

The site was in agricultural use until approximately 1937 when a Sand Pit occupied the western sector. By 1954 the Sand Pit has extended to cover the entire site. By 1962, the Sand Pit was no longer present and the site was occupied by buildings, a tank, and a hopper in the western sector and a pond in the eastern sector. The site was a landfill between 1962 and 1992 and by 2006, it was a field.

4.2.2. Proposed site design: potentially polluting substances and prevention measures

All activities are carried out on a concrete impermeable surface. Surface water drainage is collected and discharged through an oil interceptor to a pond with a penstock valve which then discharges to surface water. Potentially polluting liquids such as abatement and dosing chemicals are stored using appropriate containment measures. Any spills or leaks are dealt with under the sites spill procedures. There are no discharges to ground.

Under Article 22(2) of the IED the Applicant is required to provide a baseline report containing at least the information set out in paragraphs (a) and (b) of the Article before starting operation.

The Applicant has submitted a site condition report which includes a report on the baseline conditions as required by Article 22. We have reviewed that report and consider that it adequately describes the condition of the soil and groundwater prior to the start of operations.

The baseline report is an important reference document in the assessment of contamination that might arise during the operational lifetime of the installation and at cessation of activities at the installation.

4.2.3. Closure and decommissioning

Pre-operational condition PO1 requires the Operator to have an Environmental Management System in place before the Installation is operational, and this will include a site closure plan.

At the definitive cessation of activities, the Operator has to satisfy us that the necessary measures have been taken so that the site ceases to pose a risk to soil or groundwater, taking into accounts both the baseline conditions and the site's current or approved future use. To do this, the Operator will apply to us for surrender of the permit, which we will not grant unless and until we are satisfied that these requirements have been met.

4.3. Operation of the installation – general issues

4.3.1. Administrative issues

This is a multi-Operator Installation. The adjacent waste water treatment facility (EPR/ZP3237YL – Astwood Energy Limited) utilises heat generated by the biomass energy plant and is the only recipient of this heat. The two sites are technically connected and form one Installation but are operated by different companies therefore two permits are required, one for each operator covering the activities they're responsible for.

We are satisfied that the Operator is the person who will have control over the operation of the Installation and they will be able to operate the Installation so as to comply with the conditions included in the Permit.

The co-incineration of waste is not a specified waste management activity (SWMA). The Environment Agency has considered whether any of the other activities taking place at the Installation are SWMAs and is satisfied that none are taking place.

We are satisfied that the Applicant's submitted Opra profile was accurate at the time of application. Following the introduction of a new charging scheme in April 2018 the Opra profile is no longer required.

The new charging scheme will be used as the basis for subsistence and other charging to ensure fees are proportionate for the level of regulation required.

4.3.2. Management

The Applicant has stated in the Application that they will implement an Environmental Management System (EMS) that will be certified under ISO14001. A pre-operational condition (PO1) is included requiring the Operator to provide a summary of the EMS prior to commissioning of the plant and to make available for inspection all EMS documentation. The Environment Agency recognises that certification of the EMS cannot take place until the Installation is operational. An improvement condition (IC1) is included requiring the Operator to report progress towards gaining accreditation of its EMS.

We are satisfied that appropriate management systems and management structures will be in place for this Installation, and that sufficient resources are available to the Operator to ensure compliance with all the Permit conditions.

4.3.3. Site security

Having considered the information submitted in the Application, we are satisfied that appropriate infrastructure and procedures will be in place to ensure that the site remains secure.

4.3.4. Accident management

The Applicant submitted an Accident Management Plan. Having considered the plan and other information submitted in the Application, we are satisfied that appropriate measures will be in place to ensure that accidents that may cause pollution are prevented but that, if they should occur, their consequences are minimised. The Accident Management Plan will form part of the Environmental Management System and must be in place prior to commissioning as required by a pre-operational condition (PO1).

The Applicant submitted a Fire Prevention Plan (RB-E10), which updates were received for in Schedule 5 notice response on 14 May 2018. Having considered the plan and other information submitted in the Application, we are satisfied that the appropriate measures will be in place to ensure that the risk of fires is prevented or minimised and if they should occur, their consequences are minimised.
The detection and suppression system has not been installed by a UKAS accredited third party. PO7 has been included requiring the operator to demonstrate and alternative third party accreditation.

4.3.5. Off-site conditions

We do not consider that any off-site conditions are necessary.

4.3.6. Operating techniques

We have specified that the Applicant must operate the Installation in accordance with the following documents contained in the Application:

Description	Parts Included	Justification
Application	Application form Part B3, section 3 Operating Techniques and Appendices 5 and 6. This includes EPR permit application support document, SOL1709RB01, which also contains:	This part of the application form refers to the main application document containing the operating techniques including compliance with relevant IED requirements, whether directly written or

	• Working plan: – RB-E04 - Off Site Waste Transfers – RB-E06 - Environmental Records – RB-E07 - Environmental Management and Monitoring Programme – RB-E08 - Infrastructure Management and Monitoring Programme – RB-E10 - Fire Prevention Plan (RB-E01, RB-E02, RB-E03, RB-E05, RB-E09 were included in the application but were subsequently replaced with updates provided in Schedule 5 notice, see below)	appended as a separate document. There were some updates in the Schedule 5 response as detailed below.
Request for information	Response to Schedule 5 notice dated 03/04/18 • Further details on: • Site management responsibilities • Fire Prevention Plan, updates to RB-E10 • Spillage equipment • Management of fly ash/APRC and tramp material • Energy efficiency • Waste produced • Hot load risk assessment • Fuel specification • Updated site plans • Updated RB-E09 - Accident management plan • Updated procedures: – RB-E01 - Waste Pre-Acceptance – RB-E02 - Waste Acceptance – RB-E03 - Waste Rejection – RB-E05 - Waste Reception and Storage • RB-E09 - Accident management plan • Deed of easement – agreement with Astwood Limited to receive site water.	As a response to a Schedule 5 notice the applicant provided additional updates to the facility's operation.

The details set out above describe the techniques that will be used for the operation of the Installation that have been assessed by the Environment Agency as BAT; they form part of the Permit through Permit condition 2.3.1 and Table S1.2 in the Permit Schedules.

We have also specified the following limits and controls on the use of raw materials and fuels:

Raw Material or Fuel	**Specifications**	**Justification**
Gas oil	< 0.1% sulphur content	As required by Sulphur Content of Liquid Fuels Regulations.

Article 45(1) of the IED requires that the Permit must include a list of all types of waste which may be treated using at least the types of waste set out in the European Waste List established by Decision 2005/532/EC, EC, if possible, and containing information on the quantity of each type of waste, where appropriate. The Application contains a list of those wastes in section 3.4.1 of the Application Supporting Document coded by the European Waste Catalogue (EWC) number, which the Applicant originally proposed to accept in the waste streams entering the plant and which the plant is capable of burning in an environmentally acceptable way. We have clarified the type of waste the Applicant will accept, a revised list is included in the response to our request for information (response dated 14/05/2018). We have specified the permitted waste types, descriptions and where appropriate quantities which can be accepted at the installation in Table S2.2 of the permit.

We are satisfied that the Applicant can accept the wastes contained in Table S2.2 of the Permit because:

- the wastes are all categorised as non-hazardous in the European Waste Catalogue and are capable of being safely burnt at the installation.
- these wastes are likely to be within the design calorific value (CV) range for the plant;
- these wastes are unlikely to contain harmful components that cannot be safely processed at the Installation.

We have limited the capacity of the Installation to 50,400 tonnes per annum. This is based on the Installation operating 8,400 hours per year at a nominal capacity of 6 tonnes per hour.

The Installation will be designed, constructed and operated using BAT for the incineration of the permitted wastes. We are satisfied that the operating and abatement techniques are BAT for incinerating these types of waste. Our assessment of BAT is set out later in this document.

4.3.7. Energy efficiency

(i) Consideration of energy efficiency

We have considered the issue of energy efficiency in the following ways:

1. The use of energy within, and generated by, the Installation which are normal aspects of all EPR permit determinations. This issue is dealt with in this section.

2. The extent to which the Installation meets the requirements of Article 50(5) of the IED, which requires *"the heat generated* during the incineration and co-incineration process is *recovered as far as practicable through the generation of heat, steam or power*". This issue is covered in this section.

3. The combustion efficiency and energy utilisation of different design options for the Installation are relevant considerations in the determination of BAT for the Installation, including the Global Warming Potential of the different options. This aspect is covered in the BAT assessment in section 6 of this Decision Document.

4. The extent to which the Installation meets the requirement of Article 14(5) of the Energy Efficiency Directive which requires new thermal electricity generation installations with a total thermal input exceeding 20 MW to carry out a cost-benefit assessment to "*assess the cost and benefits of providing for the operation of the installation as a high-efficiency cogeneration installation*".

   Cogeneration means the simultaneous generation in one process of thermal energy and electrical or mechanical energy and is also known as combined heat and power (CHP).

   High-efficiency co-generation is cogeneration which achieves at least 10% savings in primary energy usage compared to the separate generation of heat and power – see Annex II of the Energy Efficiency Directive for detail on how to calculate this.

(ii) Use of energy within the Installation

Having considered the information submitted in the Application, we are satisfied that appropriate measures will be in place to ensure that energy is used efficiently within the Installation.

The Application details a number of measures that will be implemented at the Installation in order to increase its energy efficiency; Plant and equipment monitored by SCADA system and PLC controls, heat generated which can be utilised in a neighbouring facility, combustion plant controlled in real time, energy data monitored and recorded to target optimal performance and setting of targets to increase thermal efficiency in the EMS.

The Application states that the specific energy consumption, a measure of total energy consumed per unit of waste processed, will be 91 kWh/tonne. The installation capacity is 50,400 tonnes per annum.

Data from the BREF for Municipal Waste Incinerators shows that the range of specific energy consumptions is as in the table below.

MSWI plant size range (t/yr)	**Process energy demand (kWh/t waste input)**
Up to 150,000	300 – 700
150,000 – 250,000	150 – 500
More than 250,000	60 – 200

The BREF says that it is BAT to reduce the average installation electrical demand to generally below 150 kWh/tonne of waste with an LCV of 10.4 MJ/kg. The LCV in this case is expected to be 14.5 MJ/kg. Taking account of the difference in LCV, the specific energy consumption in the Application is in line with that set out above.

(iii) Generation of energy within the Installation - Compliance with Article 50(5) of the IED

Article 50(5) of the IED requires that *"the heat generated during the incineration and co-incineration process is recovered as far as practicable*".

We consider that as the plant is being installed to provide both electricity and heat for an industrial process under permit EPR/ZP3237YL, the Installation will recover heat as far as practicable, and therefore that the requirements of Article 50(5) are met.

(iv) Choice of Steam Turbine

The site uses screw expanders. Screw expanders differ from turbines because they are open cycle, can process wet steam and do not require condensers. In this application, steam screw expanders are beneficial as they eliminate timing gears and other costly components, generate at 50 / 60Hz and do not require the use of refrigerants.

The use of screw expanders has many advantages over steam turbine applications including:
• Simpler and more robust than turbines;
• Fewer parts;
• Lower speeds;
• Low torque transmission;
• Large displacement;
• Almost pure rolling contact between the rotors;
• Rotors not damaged by wet steam or water;
• Accepts fluctuating mass flow rates and pressures; and
• Low maintenance costs compared with other technologies.

Internal combustion systems, such as a gas turbine or a spark ignition gas engine, provide higher levels of thermal efficiency, but require highly cleaned, conditioned and stable syngas

in order for them to operate reliably. Such gas conditioning requires the removal of condensable tars and oils as well as the removal of water vapour and particulate. These residues are typically hazardous and require further treatment and processing for final disposal. Therefore, gas turbines and gas engines have been ruled out as the gas produced will not be of high enough quality.

Steam turbines have a process efficiency of up to 29% and require supercritical steam and do not allow for the recovery of useful heat in a form required for the WWTP. On this basis, steam turbines were not considered BAT for the facility due to their low efficiency (process efficiency of up to 29%).

The screw expanders have a generating efficiency of 90%.

(v) Choice of Cooling System

There is no specifically dedicated cooling system. Cooling is provided by the evaporative units permitted under EPR/ZP3237YL which spray water on the hot pipes which carry low grade steam from the plant. The cooled steam is kept in a closed loop system and returns back to the plant. If a situation arises where there is no or little waste water to provide this cooling the incinerator will be shut down.

(vi) Compliance with Article 14(5) of the Energy Efficiency Directive

The Applicant has not carried out an assessment of the potential for operating the installation as a high-efficiency cogeneration installation. The co-incineration plant has been specifically built for maximising thermal efficiency and the production of heat for the adjacent WwTP, rather than for the incineration of waste. The plant has an input capacity of 22.97 MWth and produces 18.707 MW of exportable steam and 538 kW of exportable electricity making the plant 83.8% efficient.

(vii) Permit conditions concerning energy efficiency

The Operator is required to report energy usage and energy generated under condition 4.2 and Schedule 5. The following parameters are required to be reported: total electrical energy generated; electrical energy exported; total energy usage and energy exported as heat (if any). Together with the total wood waste burned per year, this will enable the Environment Agency to monitor energy recovery efficiency at the Installation and take action if at any stage the energy recovery efficiency is less than proposed.

There are no site-specific considerations that require the imposition of standards beyond indicative BAT, and so the Environment Agency accepts that the Applicant's proposals represent BAT for this Installation.

4.3.8. Efficient use of raw materials

Having considered the information submitted in the Application, we are satisfied that the appropriate measures will be in place to ensure the efficient use of raw materials and water.

The Operator is required to report with respect to raw material usage under condition 4.2 and Schedule 5, including consumption of sodium bi-carbonate, powdered activated carbon and urea used per tonne of waste burned. This will enable the Environment Agency to assess whether there have been any changes in the efficiency of the air pollution control plant, and the operation of the SNCR to abate NO_x. These are the most significant raw materials that will be used at the Installation, other than the waste feed itself (addressed elsewhere). The efficiency of the use of auxiliary fuel will be tracked separately as part of the energy reporting requirement under condition 4.2.1. Optimising reagent dosage for air abatement systems and minimising the use of auxiliary fuels is further considered in the section on BAT.

4.3.9. Avoidance, recovery or disposal with minimal environmental impact of wastes produced by the activities

This requirement addresses wastes produced at the Installation and does not apply to the waste being treated there. The principal waste streams the Installation will produce, are tramp material and air pollution control residues/fly ash.

The first objective is to avoid producing waste at all. Waste production will be avoided by achieving a high degree of burnout of the ash in the furnace, which results in a material that is both reduced in volume and in chemical reactivity. Condition 3.1.3 and associated Table S3.4 (Residue quality) specify limits for total organic carbon (TOC) of <3% in bottom ash. Compliance with this limit will demonstrate that good combustion control and waste burnout is being achieved in the furnaces and waste generation is being avoided where practicable.

Incinerator bottom ash (IBA) will normally be classified as non-hazardous waste. However, IBA is classified on the European List of Wastes as a "mirror entry", which means IBA is a hazardous waste if it possesses a hazardous property relating to the content of dangerous substances. Monitoring of incinerator ash will be carried out in accordance with the requirements of Article 53(3) of IED. Classification of IBA for its subsequent use or disposal is controlled by other legislation and so is not duplicated within the permit.

Air pollution control (APC) residues from flue gas treatment are hazardous waste and therefore must be sent for disposal to a landfill site permitted to accept hazardous waste, or to an appropriately permitted facility for hazardous waste treatment. The amount of APC residues is minimised through optimising the performance of the air emissions abatement plant.

In order to ensure that the IBA residues are adequately characterised, pre-operational condition PO2 requires the Operator to provide a written plan for approval detailing the ash sampling protocols. Table S3.4 requires the Operator to carry out an ongoing programme of monitoring.

The Application also proposes that, where possible, tramp material will be transported to a suitable recycling facility.

Having considered the information submitted in the Application, we are satisfied that the waste hierarchy referred to in Article 4 of the WFD will be applied to the generation of waste and that any waste generated will be treated in accordance with this Article.

We are satisfied that waste from the Installation that cannot be recovered will be disposed of using a method that minimises any impact on the environment. Standard condition 1.4.1 will ensure that this position is maintained.

5. Minimising the Installation's environmental impact

Regulated activities can present different types of risk to the environment, these include odour, noise and vibration; accidents, fugitive emissions to air and water; as well as point source releases to air, discharges to ground or groundwater, global warming potential and generation of waste and other environmental impacts. Consideration may also have to be given to the effect of emissions being subsequently deposited onto land (where there are ecological receptors). All these factors are discussed in this and other sections of this document.

For an installation of this kind, the principal emissions are those to air, although we also consider those to land and water.

The next sections of this document explain how we have approached the critical issue of assessing the likely impact of the emissions to air from the Installation on human health and the environment and what measures we are requiring to ensure a high level of protection.

5.1. Assessment methodology

5.1.1. Application of Environment Agency guidance 'risk assessments for your environmental permit'

A methodology for risk assessment of point source emissions to air, which we use to assess the risk of applications we receive for permits, is set out in our guidance 'Air emissions risk assessment for your environmental permit' and has the following steps:

- Describe emissions and receptors
- Calculate process contributions
- Screen out insignificant emissions that do not warrant further investigation
- Decide if detailed air modelling is needed
- Assess emissions against relevant standards
- Summarise the effects of emissions

The methodology uses a concept of "process contribution (PC)", which is the estimated concentration of emitted substances after dispersion into the receiving environmental media at the point where the magnitude of the concentration is greatest. The methodology provides a simple method of calculating PC primarily for screening purposes and for estimating process contributions where environmental consequences are relatively low. It is based on using dispersion factors. These factors assume worst case dispersion conditions with no allowance made for thermal or momentum plume rise and so the process contributions calculated are likely to be an overestimate of the actual maximum concentrations. More accurate calculation of process contributions can be achieved by mathematical dispersion models, which take into account relevant parameters of the release and surrounding conditions, including local meteorology – these techniques are expensive but normally lead to a lower prediction of PC.

5.1.2. Use of Air Dispersion Modelling

For incineration applications, we normally require the Applicant to submit a full air dispersion model as part of their application. Air dispersion modelling enables the process contribution to be predicted at any environmental receptor that might be impacted by the plant.

Once short-term and long-term PCs have been calculated in this way, they are compared with Environmental Standards (ES).

Where an Ambient Air Directive (AAD) Limit Value exists, the relevant standard is the AAD Limit Value. Where an AAD Limit Value does not exist, AAD target values, UK Air Quality Strategy (AQS) Objectives or Environmental Assessment Levels (EALs) are used. Our web guide sets out EALs which have been derived to provide a similar level of protection to Human Health and the Environment as the AAD limit values, AAD target and AQS objectives. In a very small number of cases, e.g. for emissions of lead, the AQS objective is more stringent that the AAD value. In such cases, we use the AQS objective for our assessment.

AAD target values, AQS objectives and EALs do not have the same legal status as AAD limit values, and there is no explicit requirement to impose stricter conditions than BAT in order to comply with them. However, they are a standard for harm and any significant contribution to a breach is likely to be unacceptable.

PCs are considered **Insignificant** if:

- the **long-term** process contribution is less than **1%** of the relevant ES; and
- the **short-term** process contribution is less than **10%** of the relevant ES.

The **long term** 1% process contribution insignificance threshold is based on the judgements that:

- It is unlikely that an emission at this level will make a significant contribution to air quality;
- The threshold provides a substantial safety margin to protect health and the environment.

The **short term** 10% process contribution insignificance threshold is based on the judgements that:

- spatial and temporal conditions mean that short term process contributions are transient and limited in comparison with long term process contributions;
- the threshold provides a substantial safety margin to protect health and the environment.

Where an emission is screened out in this way, we would normally consider that the Applicant's proposals for the prevention and control of the emission to be BAT. That is because if the impact of the emission is already insignificant, it follows that any further reduction in this emission will also be insignificant.

However, where an emission cannot be screened out as insignificant, it does not mean it will necessarily be significant.

For those pollutants which do not screen out as insignificant, we determine whether exceedences of the relevant ES are likely. This is done through detailed audit and review of the Applicant's air dispersion modelling taking background concentrations and modelling uncertainties into account. Where an exceedance of an AAD limit value is identified, we may require the Applicant to go beyond what would normally be considered BAT for the Installation or we may refuse the application if the applicant is unable to provide suitable proposals. Whether or not exceedances are considered likely, the application is subject to the requirement to operate in accordance with BAT.

This is not the end of the risk assessment, because we also take into account local factors (for example, particularly sensitive receptors nearby such as a SSSIs, SACs or SPAs). These additional factors may also lead us to include more stringent conditions than BAT.

If, as a result of reviewing of the risk assessment and taking account of any additional techniques that could be applied to limit emissions, we consider that emissions **would cause significant pollution**, we would refuse the Application.

5.2. Assessment of Impact on Air Quality

The Applicant's assessment of the impact of air quality is set out in Annex C2 of the Application. Updates to this were provided on 15/03/18. The assessment comprises:

- A screening assessment using the Environment Agency screening tool of emissions to air from the operation of the incinerator.
- Dispersion modelling of emissions to air from the operation of the incinerator.
- A study of the impact of emissions on nearby sensitive habitat/conservation sites.

This section of the decision document deals primarily with the dispersion modelling of emissions to air from the incinerator chimney and its impact on local air quality. The impact on conservation sites is considered in section 5.4.

The Applicant has assessed the Installation's potential emissions to air against the relevant air quality standards, and the potential impact upon local conservation and habitat sites and human health. These assessments predict the potential effects on local air quality from the Installation's stack emissions using the Breeze AERMOD 7 dispersion model, which is a commonly used computer model for regulatory dispersion modelling. The model used 5 years of meteorological data collected from the weather station at Church Lawford between 2011 and 2015. The impact of the terrain surrounding the site upon plume dispersion was considered in the dispersion modelling.

The air impact assessments, and the dispersion modelling upon which they were based, employed the following assumptions.

- First, they assumed that the ELVs in the Permit would be the maximum permitted by Article 46(2) and Annex VI of the IED. These substances are:
  - Oxides of nitrogen (NO_x), expressed as NO_2
  - Particulate matter
  - Carbon monoxide (CO)
  - Sulphur dioxide (SO_2)
  - Hydrogen chloride (HCl)
  - Hydrogen fluoride (HF)
  - Metals (Cadmium, Thallium, Mercury, Antimony, Arsenic, Lead, Chromium, Cobalt, Copper, Manganese, Nickel and Vanadium)
  - Polychlorinated dibenzo-para-dioxins and polychlorinated dibenzo furans (referred to as dioxins and furans)
  - Gaseous and vaporous organic substances, expressed as Total Organic Carbon (TOC)

- Second, they assumed that the Installation operates continuously at the relevant long-term or short-term ELVs, i.e. the maximum permitted emission rate (except for emissions of arsenic, chromium and nickel, which are considered in section 5.2.3 of this decision document).
- Third, the model also considered emissions of pollutants not covered by Annex VI of IED, specifically ammonia (NH_3), polycyclic aromatic hydrocarbons (PAH) and Polychlorinated biphenyls (PCBs). Emission rates used in the modelling have been drawn from data in the Waste Incineration BREF and are considered further in section 5.2.5.

We are in agreement with this approach. The assumptions underpinning the model have been checked and are reasonably precautionary.

Background data has been used from Defra's mapped estimates of background concentrations on a 1 km x 1 km grid square basis. Concentrations have been considered for the nine grid squares surrounding the site and assumed that the maximum concentration for each pollutant is characteristic of the local air quality around the site. Given that there is no locally monitored data this approach is appropriate.

As well as calculating the peak ground level concentration, the Applicant has modelled the concentration of key pollutants at a number of specified locations within the surrounding area.

The way in which the Applicant used dispersion models, its selection of input data, use of background data and the assumptions it made, have been reviewed by the Environment Agency's modelling specialists to establish the robustness of the Applicant's air impact assessment. The output from the model has then been used to inform further assessment of health impacts and impact on habitats and conservation sites.

Our review of the Applicant's assessment leads us to agree with the Applicant's conclusions. We have also audited the air quality and human health impact assessment and similarly agree that the conclusions drawn in the reports were acceptable.

The Applicant's modelling predictions are summarised in the following sections.

5.2.1. Assessment of Air Dispersion Modelling Outputs

The Applicant's modelling predictions are summarised in the tables below.

The Applicant's modelling predicted peak ground level exposure of pollutants at discreet receptors. The tables below show the ground level concentrations at the most impacted receptor.

Non-metals

		Back-ground µg/m³	AQA µg/m³	PC µg/m³	PC %	PEC µg/m³	PEC %
NO2	1	15.2	40	0.6	1.6	15.9	39.7
	2	30.4	200	7.4	3.7	37.8	18.9
CO	9	209	10000	5.2	0.1	214.0	2.1
	10	298	30000	6.4	0.0	304.0	1.0
PM10	1	15.4	40	0.05	0.1	15.4	38.6
	3	18.2	50	0.1	0.3	18.3	36.6
PM2.5	1	10.8	25	0.03	0.1	10.8	43.3
SO2	6	3.3	125	1.9	1.5	5.2	4.1
	5	5.6	350	5	1.4	10.6	3
	4	7.5	266	7.9	3	15.4	5.8
TOC	1	0.39	5	0.05	1	0.44	8.8
	7	0.78	195	1.3	0.7	2.1	1.1

HCl	7	0.52	750	1.3	0.2	1.8	0.2
HF	8	0.5	16	0.005	0	0.5	3.2
	7	1	160	0.13	0.1	1.1	0.7
D/F	n/a	6.9 fg/m^3	n/a	0.48 fg/m^3	7.4 $	n/a	n/a
PAH	1	0.062 ng/m^3	1.0 ng/m^3 ^	0.005 ng/m^3	0.5	0.067 ng/m^3	6.7
	1	0.062 ng/m^3	0.25 ng/m^3 ^	0.005 ng/m^3	2.0	0.067 ng/m^3	26.8
PCB	1	0.026 ng/m^3	200 ng/m^3	0.02 ng/m^3	0	0.05 ng/m^3	0
	10	0.052 ng/m^3	6000 ng/m^3	0.64 ng/m^3	0	0.69 ng/m^3	0
NH_3	1	3	180	0.02	0	3	1.7
	10	6	2500	0.64	0	6.6	0.3

1 - Annual Mean
2 - 99.79th %ile of 1-hour means
3 - 90.41st %ile of 24-hour means
4 - 99.9th ile of 15-min means
5 - 99.73rd %ile of 1-hour means
6 - 99.18th %ile of 24-hour means
7 - 1-hour average
8 - Monthly average
9 - Maximum daily running 8-hour mean
10 - 1-hour maximum

TOC as 1,3 butadiene

PAH as benzo[a]pyrene

^ The applicants report used an environmental standard of 1 ng/m^3 for PAH. This is the Ambient Air Directive value. We apply an environmental assessment level of 0.25 ng/m^3.
$ PC as % of background as no AQA.

Metals

			Background µg/m^3	AQA µg/m^3	PC %	PEC %
Group 2 metals	**Cd**	1	0.00025	0.005	9.4	14.4
	Tl	1	Unknown	1	0.0	-
		2	Unknown	30	0.0	-
Group 1 metals	**Hg**	1	0.011	0.25	0.2	4.7
		2	0.023	7.5	0.1	0.4
Group 3 metals	**Sb**	1	Unknown	5	0.1	-
		2	Unknown	150	0.1	-
	As	1	0.00064	0.0030	157	178
	As*	1	0.00064	0.0030	3.9	14.6
	As	2	0.0013	15	0.6	0.6
	Pb	1	0.0097	0.25	1.9	5.8
	Cr III	1	0.0094	5	4.7	14.1
		2	0.019	3	2.8	3.4
	Cr VI	1	0.0019	0.00020	470.9	1407.9
	Cr VI*	1	0.0019	0.00020	0.1	937
	Co	1	0.00021	1	2.4	2.5
		2	0.00042	6	1.4	1.4
	Cu	1	0.01	10	0.0	0.1

		2	0.0102	200	0.0	0.1
	Mn	1	0.011	0.15	3.1	10.5
		2	0.022	1500	0.0	0.0
	Ni	1	0.0042	0.02	23.5	44.5
	V	1	0.0012	5	0.1	0.1
		3	0.014	1	5.0	5.1
1 - Annual Mean 2 - 99.79th %ile of 1-hour means 3 - 90.41st %ile of 24-hour means *Additional assessment carried out by the applicant following guidance Waste incinerators: guidance on impact assessment for group 3 metals stack. See section 5.2.3 below.						

(i) Screening out emissions which are insignificant

From the tables above the following emissions can be screened out as insignificant in that the process contribution is < 1% of the long term ES and <10% of the short term ES. These are:

- CO, PM_{10}, $PM_{2.5}$, SO_2, TOC, HCl, HF, PAH (using 1 ng/m^3), PCB, Tl, Hg, Sb, Cu, V, As, Cr VI and NH_3

Therefore we consider the Applicant's proposals for preventing and minimising the emissions of these substances to be BAT for the Installation subject to the detailed audit referred to below.

(ii) Emissions unlikely to give rise to significant pollution

Also from the tables above the following emissions (which were not screened out as insignificant) have been assessed as being unlikely to give rise to significant pollution in that the predicted environmental concentration is less than 100% (taking expected modelling uncertainties into account) of both the long term and short term ES.

- NO_2, PAH (using 0.25 ng/m^3), Cd, Pb, Cr III, Co, Mn and Ni

For these emissions, we have carefully scrutinised the Applicant's proposals to ensure that they are applying the Best Available Techniques to prevent and minimise emissions of these substances. This is reported in section 6 of this document.

(iii) Emissions requiring further assessment

All emissions either screen out as insignificant or where they do not screen out as insignificant are considered unlikely to give rise to significant pollution.

5.2.2. Consideration of key pollutants

(i) Nitrogen dioxide (NO_2)

The impact on air quality from NO_2 emissions has been assessed against the ES of 40 μg/m^3 as a long term annual average and a short term hourly average of 200 μg/m^3. The model assumes a 70% NO_X to NO_2 conversion for the long term and 35% for the short term assessment in line with Environment Agency guidance on the use of air dispersion modelling.

The above tables show that the peak short term PC is less than 10% of the ES and so can be screened out as insignificant. The peak long term PC is greater than 1% of the ES and therefore cannot be screened out as insignificant. Even so, from the table above, the emission is not expected to result in the ES being exceeded. Therefore we consider the Applicant's proposals for preventing and minimising the emissions of these substances to be BAT for the Installation.

(ii) Particulate matter PM_{10} and $PM_{2.5}$

The impact on air quality from particulate emissions has been assessed against the ES for PM_{10} (particles of 10 microns and smaller) and $PM_{2.5}$ (particles of 2.5 microns and smaller). For PM_{10}, the ES are a long term annual average of 40 $\mu g/m^3$ and a short term daily average of 50 $\mu g/m^3$. For $PM_{2.5}$ the ES of 25 $\mu g/m^3$ as a long-term annual average to be achieved by 2010 as a Target Value and by 2015 as a Limit Value has been used.

The Applicant's predicted impact of the Installation against these ESs are shown in the tables above. The assessment assumes that **all** particulate emissions are present as PM_{10} for the PM_{10} assessment and that **all** particulate emissions are present as $PM_{2.5}$ for the $PM_{2.5}$ assessment.

The above assessment is considered to represent a worst case assessment in that: -

- It assumes that the plant emits particulates continuously at the IED Annex VI limit for total dust, whereas actual emissions from similar plant are normally lower.
- It assumes all particulates emitted are below either 10 microns (PM_{10}) or 2.5 microns ($PM_{2.5}$), when some are expected to be larger.

We have reviewed the Applicant's particulate matter impact assessment and are satisfied in the robustness of the Applicant's conclusions.

The above assessment shows that the predicted process contribution for emissions of PM_{10} is below 1% of the long term ES and below 10% of the short term ES and so can be screened out as insignificant. Therefore we consider the Applicant's proposals for preventing and minimising the emissions of particulates to be BAT for the Installation.

The above assessment also shows that the predicted process contribution for emissions of $PM_{2.5}$ is also below 1% of the ES. Therefore the Environment Agency concludes that particulate emissions from the Installation, including emissions of PM_{10} or $PM_{2.5}$, will not give rise to significant pollution.

There is currently no emission limit prescribed nor any continuous emissions monitor for particulate matter specifically in the PM_{10} or $PM_{2.5}$ fraction. Whilst the Environment Agency is confident that current monitoring techniques will capture the fine particle fraction ($PM_{2.5}$) for inclusion in the measurement of total particulate matter, an improvement condition (IC2) has been included that will require a full analysis of particle size distribution in the flue gas, and hence determine the ratio of fine to coarse particles. In the light of current knowledge and available data however the Environment Agency is satisfied that the health of the public would not be put at risk by such emissions, as explained in section 5.3.3.

(iii) Acid gases, SO_2, HCl and HF

From the tables above, emissions of HCl and HF can be screened out as insignificant in that the process contribution is <10% of the short term ES. There is no long term ES for HCl. HF has 2 assessment criteria – a 1-hr ES and a monthly EAL – the process contribution is <1% of the monthly EAL and so the emission screens out as insignificant if the monthly ES is interpreted as representing a long term ES.

There is no long term EAL for SO_2 for the protection of human health. Protection of ecological receptors from SO_2 for which there is a long term ES is considered in section 5.4.

Emissions of SO_2 can also be screened out as insignificant in that the short term process contribution is also <10% of each of the three short term ES values. Therefore we consider the Applicant's proposals for preventing and minimising the emissions of these substances to be BAT for the Installation.

(iv) Emissions to Air of CO, VOCs, PAHs, PCBs, Dioxins and NH_3

The above tables show that for CO and VOC emissions, the peak long term PC is less than 1% of the ES and the peak short term PC is less than 10% of the ES and so can be screened out as

insignificant. Therefore we consider the Applicant's proposals for preventing and minimising the emissions of these substances to be BAT for the Installation.

The Applicant has used the ES for benzene for their assessment of the impact of VOC. This is based on benzene having a low, precautionary ES of organic species likely to be present in VOC (other than PAH, PCBs, dioxins and furans).

The above tables show that for PCB emissions, the peak long term PC is less than 1% of the ES and the peak short term PC is less than 10% of the ES for PCBs and so can be screened out as insignificant. Therefore we consider the Applicant's proposals for preventing and minimising the emissions of these substances to be BAT for the Installation.

The above tables show that for PAH emissions, the peak long term PC is greater than 1% of the ES and therefore cannot be screened out as insignificant. Even so, from the table above, the emission is not expected to result in the ES being exceeded. The peak short term PC for PCBs is marginally above the level that would screen out as insignificant (>10% of the ES). However it is not expected to result in the ES being exceeded.

The Applicant has also used the ES for benzo[a]pyrene (BaP) for their assessment of the impact of PAH. We agree that the use of the BaP ES is sufficiently precautionary.

There is no ES for dioxins and furans as the principal exposure route for these substances is by ingestion and the risk to human health is through the accumulation of these substances in the body over an extended period of time. This issue is considered in more detail in section 5.3

From the tables above all the other emissions can be screened out as insignificant in that the process contribution is < 1% of the long term ES and <10% of the short term ES.

The ammonia emission is based on a release concentration of 5 mg/m^3. We are satisfied that this level of emission is consistent with the operation of a well-controlled SNCR NO_x abatement system.

Whilst all emissions cannot be screened out as insignificant, the Applicant's modelling shows that the installation is unlikely to result in a breach of the EAL. The Applicant is required to prevent, minimise and control PAH and VOC emissions using BAT, this is considered further in Section 6. We are satisfied that PAH and VOC emissions will not result in significant pollution.

(v) Summary

For the above emissions to air, for those emissions that do not screen out, we have carefully scrutinised the Applicant's proposals to ensure that they are applying BAT to prevent and minimise emissions of these substances. This is reported in section 6 of this document. Therefore we consider the Applicant's proposals for preventing and minimising emissions to be BAT for the Installation. Dioxins and furans are considered further in section 5.3.2.

5.2.3. Assessment of Emission of Metals

The Applicant has assessed the impact of metal emissions to air, as previously described.

Annex VI of IED sets three limits for metal emissions:

- An emission limit value of 0.05 mg/m^3 for mercury and its compounds (formerly WID group 1 metals).
- An aggregate emission limit value of 0.05 mg/m^3 for cadmium and thallium and their compounds (formerly WID group 2 metals).
- An aggregate emission limit of 0.5 mg/m^3 for antimony, arsenic, lead, chromium, cobalt, copper, manganese, nickel and vanadium and their compounds (formerly WID group 3 metals).

In addition the UK is a Party to the Heavy Metals Protocol within the framework of the UN-ECE Convention on long-range trans-boundary air pollution. Compliance with the IED Annex VI emission limits for metals along with the Application of BAT also ensures that these requirements are met.

In section 5.2.1 above, the following emissions of metals were screened out as insignificant:

- Tl, Hg, Sb, Cu and V

Also in section 5.2.1, the following emissions of metals whilst not screened out as insignificant were assessed as being unlikely to give rise to significant pollution:

- Cd, Pb, Cr III and Co

This left emissions of As and Cr VI requiring further assessment. For all other metals, the Applicant has concluded that exceedances of the EAL for all metals are not likely to occur.

For metals As and Cr VI the Applicant used representative emissions data from other municipal waste incinerators using our guidance note. Please refer to "Guidance to Applicants on Impact Assessment for Group 3 Metals Stack Releases – version 4". Based on this, Cr VI screened out as insignificant and As, although not insignificant was assessed as unlikely to cause significant pollution.

The 2009 report of the Expert Panel on Air Quality Standards (EPAQS) – "Guidelines for Metal and Metalloids in Ambient Air for the Protection of Human Health", sets non statutory ambient air quality guidelines for Arsenic, Nickel and Chromium (VI). These guidelines have been incorporated as ESs in our guidance 'Air emissions risk assessment for your environmental permit'

Chromium (VI) is not specifically referenced in Annex VI of IED, which includes only total Chromium as one of the nine Group 3 metals, the impact of which has been assessed above. The EPAQS guidelines refer only to that portion of the metal emissions contained within PM_{10} in ambient air. The guideline for Chromium (VI) is 0.2 ng/m^3.

Measurement of Chromium (VI) at the levels anticipated at the stack emission points is expected to be difficult, with the likely levels being below the level of detection by the most advanced methods. We have considered the concentration of total chromium and chromium (VI) in the APC residues collected upstream of the emission point for existing Municipal Waste incinerators and have assumed these to be similar to the particulate matter released from the emission point. This data shows that the mean Cr(VI) emission concentration (based on the bag dust ratio) is $3.5 * 10^{-5}$ mg/m^3 (max $1.3 * 10^{-4}$).

The Applicant has used the above data to model the predicted Cr(VI) impact. The PC is predicted as 0.1% of the EAL.

This assessment shows that emissions of Chromium (VI) screens out as insignificant. We agree with the Applicant's conclusions. The installation has been assessed as meeting BAT for control of metal emissions to air. See section 6 of this document.

5.2.4. Consideration of Local Factors

(i) Impact on Air Quality Management Areas (AQMAs)

No Air Quality Management Areas (AQMAs) have been declared within an area likely to be affected by emissions from the incinerator.

5.3. Human health risk assessment

5.3.1. Our role in preventing harm to human health

The Environment Agency has a statutory role to protect the environment and human health from all processes and activities it regulates. We assessed the effects on human health for this application in the following ways:

(i) Applying Statutory Controls

The plant will be regulated under EPR. These regulations include the requirements of relevant EU Directives, notably, the industrial emissions directive (IED), the waste framework directive (WFD), and ambient air directive (AAD).

The main conditions in an EfW permit are based on the requirements of the IED. Specific conditions have been introduced to specifically ensure compliance with the requirements of Chapter IV. The aim of the IED is to prevent or, where that is not practicable, to reduce emissions to air, water and land and prevent the generation of waste, in order to achieve a high level of protection of the environment taken as a whole. IED achieves this aim by setting operational conditions, technical requirements and emission limit values to meet the requirements set out in Articles 11 and 18 of the IED. These requirements include the application of BAT, which may in some circumstances dictate tighter emission limits and controls than those set out in Chapter IV of IED on waste incineration and co-incineration plants. The assessment of BAT for this installation is detailed in section 6 of this document.

(ii) Environmental Impact Assessment

Industrial activities can give rise to odour, noise and vibration, accidents, fugitive emissions to air and water, releases to air (including the impact on Photochemical Ozone Creation Potential (POCP)), discharges to ground or groundwater, global warming potential and generation of waste. For an installation of this kind, the principal environmental effects are through emissions to air, although we also consider all of the other impacts listed. Section 5.1 and 5.2 above explain how we have approached the critical issue of assessing the likely impact of the emissions to air from the Installation on human health and the environment and any measures we are requiring to ensure a high level of protection.

(iii) Expert Scientific Opinion

We take account of the views of national and international expert bodies. The gathering of evidence is a continuing process. Although gathering evidence is not our role we keep the available evidence under review. The following is a summary of some of the publications which we have considered (in no particular order).

An independent review of evidence on the health effects of municipal waste incinerators was published by **DEFRA** in 2004. It concluded that there was no convincing link between the emissions from MSW incinerators and adverse effects on public health in terms of cancer, respiratory disease or birth defects. On air quality effects, the report concluded “Waste incinerators contribute to local air pollution. This contribution, however, is usually a small proportion of existing background levels which is not detectable through environmental monitoring (for example, by comparing upwind and downwind levels of airborne pollutants or substances deposited to land). In some cases, waste incinerator facilities may make a more detectable contribution to air pollution. Because current MSW incinerators are located predominantly in urban areas, effects on air quality are likely to be so small as to be undetectable in practice.”

The European Integrated Pollution Prevention and Control Bureau stated in the Reference Document on the Best Available Techniques for Waste Incineration August 2006 “European health impact assessment studies, on the basis of current evidence and modern emission performance, suggest that the local impacts of incinerator emissions to air are either negligible or not detectable.”

HPA (now PHE) in 2009 states that “The Health Protection Agency has reviewed research undertaken to examine the suggested links between emissions from municipal waste incinerators and effects on health. While it is not possible to rule out adverse health effects from modern, well-regulated municipal waste incinerators with complete certainty, any potential damage to the health of those living close-by is likely to be very small, if detectable”. In January 2012 PHE confirmed they would be undertaking a study to look for evidence of any link between municipal waste incinerators and health outcomes including low birth weight, still births and infant deaths. Their current position that modern, well run municipal waste incinerators are not a significant risk to public health remains valid. The study will extend the evidence base and provide the public with further information

Policy Advice from Government also points out that the minimal risk from modern incinerators. Paragraph 22 (Chapter 5) of WS2007 says that "research carried out to date has revealed no credible evidence of adverse health outcomes for those living near incinerators." It points out that "the relevant health effects, mainly cancers, have long incubation times. But the research that is available shows an absence of symptoms relating to exposures twenty or more years ago when emissions from incinerators were much greater than is now the case." **Paragraph 30 of PPS10** explains that "modern, appropriately located, well run and well-regulated waste management facilities should pose little risk to public health."

The **Committee on Carcinogenicity of Chemicals in Food, Consumer Products and the Environment (CoC) issued** a statement in 2000 which said that "any potential risk of cancer due to residency (for periods in excess of 10 years) near to municipal solid waste incinerators was exceedingly low and probably not measurable by the most modern epidemiological techniques." In 2009, CoC considered six further relevant epidemiological papers that had been published since the 2000 statement, and concluded that "there is no need to change the advice given in the previous statement in 2000 but that the situation should be kept under review".

Republic of Ireland Health Research Board report stated that "It is hard to separate the influences of other sources of pollutants, and other causes of cancer and, as a result, the evidence for a link between cancer and proximity to an incinerator is not conclusive".

The **Food Safety Authority of Ireland (FSAI) (2003)** investigated possible implications on health associated with food contamination from waste incineration and concluded: "In relation to the possible impact of introduction of waste incineration in Ireland, as part of a national waste management strategy, on this currently largely satisfactory situation, the FSAI considers that such incineration facilities, if properly managed, will not contribute to dioxin levels in the food supply to any significant extent. The risks to health and sustainable development presented by the continued dependency on landfill as a method of waste disposal far outweigh any possible effects on food safety and quality."

Health Protection Scotland (2009) considered scientific studies on health effects associated with the incineration of waste particularly those published after the Defra review discussed earlier. The main conclusions of this report were: "(a) For waste incineration as a whole topic, the body of evidence for an association with (non-occupational) adverse health effects is both inconsistent and inconclusive. However, more recent work suggests, more strongly, that there may have been an association between emissions (particularly dioxins) in the past from industrial, clinical and municipal waste incinerators and some forms of cancer, before more stringent regulatory requirements were implemented. (b) For individual waste streams, the evidence for an association with (non-occupational) adverse health effects is inconclusive. (c) The magnitude of any past health effects on residential populations living near incinerators that did occur is likely to have been small. (d) Levels of airborne emissions from individual incinerators should be lower now than in the past, due to stricter legislative controls and improved technology. Hence, any risk to the health of a local population living near an incinerator, associated with its emissions, should also now be lower."

The **US National Research Council Committee on Health Effects of Waste Incineration (NRC) (NRC 2000)** reviewed evidence as part of a wide ranging report. The Committee view of the published evidence was summarised in a key conclusion: "Few epidemiological studies have attempted to assess whether adverse health effects have actually occurred near individual incinerators, and most of them have been unable to detect any effects. The studies of which the committee is aware that did report finding health effects had shortcomings and failed to provide convincing evidence. That result is not surprising given the small populations typically available for study and the fact that such effects, if any, might occur only infrequently or take many years to appear. Also, factors such as emissions from other pollution sources and variations in human activity patterns often decrease the likelihood of determining a relationship between small contributions of pollutants from incinerators and observed health effects. Lack of evidence of such relationships might mean that adverse health effects did not occur, but it could mean that such relationships might not be detectable using available methods and sources."

The **British Society for Ecological Medicine (BSEM) published a report in 2005** on the health effects associated with incineration and concluded that "Large studies have shown higher rates of adult and childhood cancer and also birth defects around municipal waste incinerators: the results are consistent with the associations being causal. A number of smaller epidemiological studies support this interpretation and suggest that the range of illnesses produced by incinerators may be much wider. Incinerator emissions are a major source of fine particulates, of toxic metals and of more than 200 organic chemicals, including known carcinogens, mutagens, and hormone disrupters. Emissions also contain other unidentified compounds whose potential for harm is as yet unknown, as was once the case with dioxins. Abatement equipment in modern incinerators merely transfers the toxic load, notably that of dioxins and heavy metals, from airborne emissions to the fly ash. This fly ash is light, readily windborne and mostly of low particle size. It represents a considerable and poorly understood health hazard."

The BSEM report was reviewed by the HPA and they concluded that "Having considered the BSEM report the HPA maintains its position that contemporary and effectively managed and regulated waste incineration processes contribute little to the concentrations of monitored pollutants in ambient air and that the emissions from such plants have little effect on health." The BSEM report was also commented on by the consultants who produced the Defra 2004 report referred to above. They said that "It fails to consider the significance of incineration as a source of the substances of concern. It does not consider the possible significance of the dose of pollutants that could result from incinerators. It does not fairly consider the adverse effects that could be associated with alternatives to incineration. It relies on inaccurate and outdated material. In view of these shortcomings, the report's conclusions with regard to the health effects of incineration are not reliable."

A **Greenpeace** review on incineration and human health concluded that a broad range of health effects have been associated with living near to incinerators as well as with working at these installations. Such effects include cancer (among both children and adults), adverse impacts on the respiratory system, heart disease, immune system effects, increased allergies and congenital abnormalities. Some studies, particularly those on cancer, relate to old rather than modern incinerators. However, modern incinerators operating in the last few years have also been associated with adverse health effects."

The Health Protection Scotland report referred to above says that "the authors of the Greenpeace review do not explain the basis for their conclusion that there is an association between incineration and adverse effects in terms of criteria used to assess the strength of evidence. The weighting factors used to derive the assessment are not detailed. The objectivity of the conclusion cannot therefore be easily tested."

From this published body of scientific opinion, we take the view stated by the HPA that "While it is not possible to rule out adverse health effects from modern, well-regulated municipal waste incinerators with complete certainty, any potential damage to the health of those living close-by is likely to be very small, if detectable". We therefore ensure that permits contain conditions which require the installation to be well-run and regulate the installation to ensure compliance with such permit conditions.

(iv) Health Risk Models

Comparing the results of air dispersion modelling as part of the Environmental Impact assessment against European and national air quality standards effectively makes a health risk assessment for those pollutants for which a standard has been derived. These air quality standards have been developed primarily in order to protect human health via known intake mechanisms, such as inhalation and ingestion. Some pollutants, such as dioxins, furans and dioxin like PCBs, have human health impacts at lower ingestion levels than lend themselves to setting an air quality standard to control against. For these pollutants, a different human health risk model is required which better reflects the level of dioxin intake.

Models are available to predict the dioxin, furan and dioxin like PCBs intake for comparison with the Tolerable Daily Intake (TDI) recommended by the Committee on Toxicity of Chemicals in

Food, Consumer Products and the Environment, known as COT. These include the HHRAP model.

HHRAP has been developed by the US EPA to calculate the human body intake of a range of carcinogenic pollutants and to determine the mathematic quantitative risk in probabilistic terms. In the UK, in common with other European Countries, we consider a threshold dose below which the likelihood of an adverse effect is regarded as being very low or effectively zero.

The TDI is the amount of a substance that can be ingested daily over a lifetime without appreciable health risk. It is expressed in relation to bodyweight in order to allow for different body size, such as for children of different ages. In the UK, the COT has set a TDI for dioxins, furans and dioxin like PCB's of 2 picograms I-TEQ/Kg-body weight/day (N.B. a picogram is a million millionths (10-12) of a gram).

In addition to an assessment of risk from dioxins, furans and dioxin like PCB's, the HHRAP model enables a risk assessment from human intake of a range of heavy metals. In principle, the respective ES for these metals are protective of human health. It is not therefore necessary to model the human body intake.

COMEAP developed a methodology based on the results of time series epidemiological studies which allows calculation of the public health impact of exposure to the classical air pollutants (NO_2, SO_2 and particulates) in terms of the numbers of "deaths brought forward" and the "number of hospital admissions for respiratory disease brought forward or additional". COMEAP has issued a statement expressing some reservations about the applicability of applying its methodology to small affected areas. Those concerns generally relate to the fact that the exposure-response coefficients used in the COMEAP report derive from studies of whole urban populations where the air pollution climate may differ from that around a new industrial installation. COMEAP identified a number of factors and assumptions that would contribute to the uncertainty of the estimates. These were summarised in the Defra review as below:

- Assumption that the spatial distribution of the air pollutants considered is the same in the area under study as in those areas, usually cities or large towns, in which the studies which generated the coefficients were undertaken.
- Assumption that the temporal pattern of pollutant concentrations in the area under study is similar to that in the areas in which the studies which generated the coefficients were undertaken (i.e. urban areas).
- It should be recognised that a difference in the pattern of socio-economic conditions between the areas to be studied and the reference areas could lead to inaccuracy in the predicted level of effects.
- In the same way, a difference in the pattern of personal exposures between the areas to be studied and the reference areas will affect the accuracy of the predictions of effects.

The use of the COMEAP methodology is not generally recommended for modelling the human health impacts of individual installations. However it may have limited applicability where emissions of NO_x, SO_2 and particulates cannot be screened out as insignificant in the Environmental Impact assessment, there are high ambient background levels of these pollutants and we are advised that its use was appropriate by our public health consultees.

Our recommended approach is therefore the use of the methodology set out in our guidance for comparison for most pollutants (including metals) and dioxin intake model using the HHRAP model as described above for dioxins, furans and dioxin like PCBs. Where an alternative approach is adopted for dioxins, we check the predictions ourselves.

(v) Consultations

As part of our normal procedures for the determination of a permit application, we consult with Local Authorities, Local Authority Directors of Public Health, FSA and PHE. All issues raised by these consultations are considered in determining the application as described in Annex 4 of this document.

5.3.2. Assessment of Intake of Dioxins, Furans and Dioxin like PCBs

For dioxins, furans and dioxin like PCBs, the principal exposure route is through ingestion, usually through the food chain, and the main risk to health is through accumulation in the body over a period of time.

The human health risk assessment calculates the dose of dioxins and furans that would be received by local receptors if their food and water were sourced from the locality where the deposition of dioxins, furans and dioxin like PCBs is predicted to be the highest. This is then assessed against the Tolerable Daily Intake (TDI) levels established by the COT of 2 picograms I-TEQ / Kg bodyweight/ day.

The results of the Applicant's assessment of dioxin intake are detailed in the table below (worst – case results for each category are shown). The results showed that the predicted daily intake of dioxins, furans and dioxin like PCBs at all receptors, resulting from emissions from the proposed facility, were significantly below the recommended TDI levels.

Calculated maximum daily intake of dioxins by local receptors resulting from the operation of the proposed facility (pg I-TEQ/ kg-BW/day)

Receptor Name	Adult	Child
Farmer Northeast 1	0.051 (2.55%)	0.075 (3.75%)
Resident Meriden 1	0.00050 (0.025%)	0.0015 (0.075%)

The FSA has reported that dietary studies have shown that estimated total dietary intakes of dioxins and dioxin-like PCBs from all sources by all age groups fell by around 50% between 1997 and 2001, and are expected to continue to fall. A report in 2012 showed that Dioxin and PCB levels in food have fallen slightly since 2001. In 2001, the average daily intake by adults in the UK from diet was 0.9 pg WHO-TEQ/kg bodyweight. The additional daily intake predicted by the modelling as shown in the table above is substantially below this figure.

In 2010, FSA studied the levels of chlorinated, brominated and mixed (chlorinated-brominated) dioxins and dioxin-like PCBs in fish, shellfish, meat and eggs consumed in UK. It asked COT to consider the results and to advise on whether the measured levels of these PXDDs, PXDFs and PXBs indicated a health concern ('X' means a halogen). COT issued a statement in December 2010 and concluded that "The major contribution to the total dioxin toxic activity in the foods measured came from chlorinated compounds. Brominated compounds made a much smaller contribution, and mixed halogenated compounds contributed even less (1% or less of TDI). Measured levels of PXDDs, PXDFs and dioxin-like PXBs do not indicate a health concern". COT recognised the lack of quantified TEFs for these compounds but said that "even if the TEFs for PXDDs, PXDFs and dioxin-like PXBs were up to four fold higher than assumed, their contribution to the total TEQ in the diet would still be small. Thus, further research on PXDDs, PXDFs and dioxin-like PXBs is not considered a priority."

In the light of this statement, we assess the impact of chlorinated compounds as representing the impact of all chlorinated, brominated and mixed dioxins / furans and dioxin like PCBs.

5.3.3. Particulates smaller than 2.5 microns

The Operator will be required to monitor particulate emissions using the method set out in Table S3.1 of Schedule 3 of the Permit. This method requires that the filter efficiency must be at least 99.5 % on a test aerosol with a mean particle diameter of 0.3 µm, at the maximum flow rate anticipated. The filter efficiency for larger particles will be at least as high as this. This means that particulate monitoring data effectively captures everything above 0.3 µm and much of what is smaller. It is not expected that particles smaller than 0.3 µm will contribute significantly to the mass release rate / concentration of particulates because of their very small mass, even if present. This means that emissions monitoring data can be relied upon to measure the true mass emission rate of particulates.

Nano-particles are considered to refer to those particulates less than 0.1 µm in diameter ($PM_{0.1}$). Questions are often raised about the effect of nano-particles on human health, in particular on children's health, because of their high surface to volume ratio, making them more reactive, and their very small size, giving them the potential to penetrate cell walls of living organisms. The small size also means there will be a larger number of small particles for a given mass concentration. However the HPA statement

(referenced below) says that due to the small effects of incinerators on local concentration of particles, it is highly unlikely that there will be detectable effects of any particular incinerator on local infant mortality.

The HPA (now PHE) addresses the issue of the health effects of particulates in their September 2009 statement 'The Impact on Health of Emissions to Air from Municipal Incinerators'. It refers to the coefficients linking PM_{10} and $PM_{2.5}$ with effects on health derived by COMEAP and goes on to say that if these coefficients are applied to small increases in concentrations produced, locally, by incinerators; the estimated effects on health are likely to be small. PHE note that the coefficients that allow the use of number concentrations in impact calculations have not yet been defined because the national experts have not judged that the evidence is sufficient to do so. This is an area being kept under review by COMEAP.

In December 2010, COMEAP published a report on The Mortality Effects of Long-Term Exposure to Particulate Air Pollution in the United Kingdom. It says that "a policy which aims to reduce the annual average concentration of $PM_{2.5}$ by 1 $\mu g/m^3$ would result in an increase in life expectancy of 20 days for people born in 2008." However, "The Committee stresses the need for careful interpretation of these metrics to avoid incorrect inferences being drawn – they are valid representations of population aggregate or average effects, but they can be misleading when interpreted as reflecting the experience of individuals."

PHE also point out that in 2007 incinerators contributed 0.02% to ambient ground level PM_{10} levels compared with 18% for road traffic and 22% for industry in general. PHE noted that in a sample collected in a day at a typical urban area the proportion of $PM_{0.1}$ is around 5-10% of PM_{10}. It goes on to say that PM_{10} includes and exceeds $PM_{2.5}$ which in turn includes and exceeds $PM_{0.1}$.

This is consistent with the assessment of this application which shows emissions of PM_{10} to air to be insignificant.

We take the view, based on the foregoing evidence, that techniques which control the release of particulates to levels which will not cause harm to human health will also control the release of fine particulate matter to a level which will not cause harm to human health.

5.3.4. Assessment of Health Effects from the Installation

We have assessed the health effects from the operation of this installation in relation to the above (sections 5.3.1 to 5.3.3). We have applied the relevant requirements of the national and European legislation in imposing the permit conditions. We are satisfied that compliance with these conditions will ensure protection of the environment and human health.

Taking into account all of the expert opinion available, we agree with the conclusion reached by PHE that "While it is not possible to rule out adverse health effects from modern, well-regulated municipal waste incinerators with complete certainty, any potential damage to the health of those living close-by is likely to be very small, if detectable."

In carrying out air dispersion modelling as part of the Environmental Impact assessment and comparing the predicted environmental concentrations with European and national air quality standards, the Applicant has effectively made a health risk assessment for many pollutants. These air quality standards have been developed primarily in order to protect human health.

The Applicant's assessment of the impact from CO, PM_{10}, $PM_{2.5}$, SO_2, HCl, HF, dioxins, furans, PAH, PCBs, NH_3 and trace metals (Tl, Hg, Sb, Cu, V) have all indicated that the Installation emissions screen out as insignificant; where the impact of emissions of NO_2, TOC (as Benzene), trace metals (Cd, As, Pb, Cr III, Cr VI, Co, Mn, Ni) have not been screened out as insignificant, the assessment still shows that the predicted environmental concentrations are well within air quality standards or environmental action levels.

The Environment Agency has reviewed the methodology employed by the Applicant to carry out the health impact assessment. We agree with the consultants conclusions for human health – the proposed installation is unlikely to cause exceedance of the environmental standards. The combined impact of the

whole installation had been considered. From a human health perspective there are no changes to this conclusion.

Overall, taking into account the conservative nature of the impact assessment (i.e. that it is based upon an individual exposed for a life-time to the effects of the highest predicted relevant airborne concentrations and consuming mostly locally grown food), it was concluded that the operation of the proposed facility will not pose a significant carcinogenic or non-carcinogenic risk to human health.

Public Health England and the Local Authority Director of Public Health were consulted on the Application and concluded that they had no significant concerns regarding the risk to the health of humans from the installation. The Food Standards Agency was also consulted during the permit determination process and it concluded that it is unlikely that there will be any unacceptable effects on the human food chain as a result of the operations at the Installation. Details of the responses provided by Public Health England, the Local Authority Director of Public Health and the FSA to the consultation on this Application can be found in Annex 2.

The Environment Agency is therefore satisfied that the Applicant's conclusions presented above are soundly based and we conclude that the potential emissions of pollutants including dioxins, furans and metals from the proposed facility are unlikely to have an impact upon human health.

5.4. Impact on Habitats sites, SSSIs, non-statutory conservation sites.

5.4.1. Sites Considered

There are no Habitats (i.e. Special Areas of Conservation, Special Protection Areas or Ramsar) sites within 10Km of the proposed Installation.

The following Sites of Special Scientific Interest are located within 2Km of the Installation; Berkswell Marsh SSSI and River Blyth SSSI.

The following non-statutory local wildlife and conservation sites are located within 2Km of the Installation; Mouldings Green Farm LWS, Hampton-in-Arden LWS, Patrick Farm Meadow LWS, Berkswell Marsh Meadow LWS, Mericote Mill Pool LWS, Siden Hill Wood AW, The Somers AW, Unknown AW, The Bogs North AW and The Bogs East AW

5.4.2. SSSI Assessment

The Applicant's assessment of Berkswell Marsh SSSI was reviewed by the Environment Agency's technical specialists for air quality who agreed with the assessment's conclusions, that the proposal is not likely to damage the special features of the SSSI(s).

We carried out sensitivity checks which indicated that the process contribution for acid and nitrogen deposition could exceed 1% of the environmental. As the background concentrations at the SSSI are 329% of the ES for nitrogen deposition and 205% of the ES for acidification the PEC would always be greater than 100%. Therefore, they cannot be deemed not significant.

However, as the process contribution is modelled at <1% and taking in to account sensitivity checks and that the model uses worst case emissions scenario we do not consider that this proposal is likely to cause damage to the features of the SSSI.

Pollutant	ES ($\mu g/m^3$)	PC ($\mu g/m^3$)	PC as % of ES
Direct Impacts[2]			
NOx Annual	30	0.12	0.4
NOx Daily Mean	75	3.0	4.0
SO2	10[1]	0.03	0.3

Pollutant	ES (µg/m³)	PC (µg/m³)	PC as % of ES
Ammonia	1[1]	0.003	0.3
HF Weekly Mean	0.5	0.002	0.4
HF Daily Mean	5	0.01	0.3
Deposition Impacts[2]			
N Deposition (kgN/ha/yr)	10	0.06	0.6
Acidification (Keq/ha/yr)	1.113	0.014	0.9

[1] The lichen and bryophyte sensitivity standards for ammonia and sulphur dioxide have been assigned for this assessment as the presence of these features has been recorded in the site Management Plan for at least one of the sections of the site.

[2] Direct impact units are µg/m³ and deposition impact units are kg N/ha/yr or Keq/ha/yr.

The above figures are based on impacts from the biomass energy plant only. Emissions of ammonia, acid deposition and nitrogen deposition are also made from the adjacent waste water treatment plant operated by Astwood Energy Limited which forms part of the installation. As the impacts from the BEP alone are insignificant the combined impact assessment of both the BEP and the WwTP has been carried out under the determination of that permit.

The River Blyth SSSI was also identified as being within our screening distance criteria. As this is an aquatic feature we do not assess the impacts from air emissions on it. However the applicant included an assessment as part of their application, indicating impacts would be insignificant. We have checked the predictions and agree with their conclusions.

5.4.3. Assessment of other conservation sites

Conservation sites are protected in law by legislation. The Habitats Directive and The Convention on Wetlands of International Importance provides the highest level of protection for SACs, SPAs and Ramsars, domestic legislation provides a lower but important level of protection for SSSIs. Finally the Environment Act provides more generalised protection for flora and fauna rather than for specifically named conservation designations. It is under the Environment Act that we assess other sites (such as local wildlife sites) which prevents us from permitting something that will result in significant pollution; and which offers levels of protection proportionate with other European and national legislation. However, it should not be assumed that because levels of protection are less stringent for these other sites that they are not of considerable importance. Local sites link and support EU and national nature conservation sites together and hence help to maintain the UK's biodiversity resilience.

For SACs SPAs, Ramsars and SSSIs we consider the process contribution (PC) and the background levels in making an assessment of impact. In assessing these other sites under the Environment Act we look at the impact from the Installation alone in order to determine whether it would cause significant pollution. This is a proportionate approach, in line with the levels of protection offered by the conservation legislation to protect these other sites (which are generally more numerous than Natura 2000 or SSSIs) whilst ensuring that we do not restrict development.

Critical levels and loads are set to protect the most vulnerable habitat types. Thresholds change in accordance with the levels of protection afforded by the legislation. Therefore the thresholds for SAC, SPA, Ramsars and SSSI features are more stringent than those for other nature conservation sites.

Therefore we would generally conclude that the Installation is not causing significant pollution at these other sites if the PC is less than the relevant critical level or critical load, provided that the Applicant is using BAT to control emissions.

Pollutant	ES (µg/m³)	PC (µg/m³)	PC as % of ES
Direct Impacts[2]			
NOx Annual	30	0.63	2.1
NOx Daily Mean	75	11.6	15.5
SO2	10[1]	0.16	1.6
Ammonia	1[1]	0.016	1.6
HF Weekly Mean	0.5	0.010	1.9
HF Daily Mean	5	0.06	1.2
Deposition Impacts[2]			
N Deposition (kgN/ha/yr)	10	0.30	3.0
Acidification (Keq/ha/yr)	1.113	0.008	0.7

[1] The lichen and bryophyte sensitivity standards for ammonia and sulphur dioxide have been assigned for this assessment as the presence of these features has been recorded in the site Management Plan for at least one of the sections of the site.

[2] Direct impact units are µg/m³ and deposition impact units are kg N/ha/yr or Keq/ha/yr.

The tables show that the PCs are <100% and we can conclude that impacts from the biomass energy plant are insignificant.

As stated in 5.4.2 these figures are only for the BEP, the combined impact with the WwTP has been considered in the determination for that permit.

5.5. Impact of abnormal operations

Article 50(4)(c) of IED requires that waste incineration and co-incineration plants shall operate an automatic system to prevent waste feed whenever any of the continuous emission monitors show that an emission limit value (ELV) is exceeded due to disturbances or failures of the purification devices. Notwithstanding this, Article 46(6) allows for the continued incineration and co-incineration of waste under such conditions provided that this period does not (in any circumstances) exceed 4 hours uninterrupted continuous operation or the cumulative period of operation does not exceed 60 hours in a calendar year. This is a recognition that the emissions during transient states (e.g. start-up and shut-down) are higher than during steady-state operation, and the overall environmental impact of continued operation with a limited exceedance of an ELV may be less than that of a partial shut-down and re-start.

For incineration plant, IED sets backstop limits for particulates, CO and TOC which must continue to be met at all times. The CO and TOC limits are the same as for normal operation, and are intended to ensure that good combustion conditions are maintained. The backstop limit for particulates is 150 mg/m^3 (as a half hourly average) which is five times the limit in normal operation.

Article 45(1)(f) requires that the permit shall specify the maximum permissible period of any technically unavoidable stoppages, disturbances, or failures of the purification devices or the measurement devices, during which the concentrations in the discharges into the air may exceed the prescribed emission limit values. In this case we have decided to set the time limit at 4 hours, which is the maximum period prescribed by Article 46(6) of the IED.

These abnormal operations are limited to no more than a period of 4 hours continuous operation and no more than 60 hour aggregated operation in any calendar year. This is less than 1% of total operating hours and so abnormal operating conditions are not expected to have any significant long term environmental impact unless the background conditions were already close to, or exceeding, an ES. For the most part therefore consideration of abnormal operations is limited to consideration of its impact on short term ESs.

In making an assessment of abnormal operations the following worst case scenario has been assumed:

- Dioxin emissions of 10 ng/m^3 (100 x normal)
- NO_x emissions of 535 mg/m^3 (1.34 x normal)
- Particulate emissions of 150 mg/m^3 (5 x normal)
- SO_2 emissions of 250 mg/m^3 (1.25 x normal)
- HCl emissions of 75 mg/m^3 (1.25 x normal)

This is a worst case scenario in that these abnormal conditions include a number of different equipment failures not all of which will necessarily result in an adverse impact on the environment (e.g. a failure of a monitoring instrument does not necessarily mean that the incinerator or abatement plant is malfunctioning). This analysis assumes that any failure of any equipment results in all the negative impacts set out above occurring simultaneously.

The result on the Applicant's short-term environmental impact is summarised in the table below.

Pollutant	EQS/EAL		Back-ground	Process contribution (PC)		Predicted environmental concentration (PEC)	
	µg/m^3		µg/m^3	µg/m^3	% of EAL	µg/m^3	% of EAL
NO_2	2	200	30.4	31.1	15.6	61.5	30.8
PM_{10}	3	50	18.2	3.3	6.60	21.5	43.0
SO_2	4	266	7.5	55.6	20.9	63.1	23.7
	5	350	5.6	41.5	11.86	47.1	13.5
	6	125	3.3	8.3	6.64	11.6	9.28
HCl	7	750	0.52	12.4	1.65	12.9	1.72
CO	8	10,000	209	9.3	0.1	218.3	2.2
HF	7	160	1	0.8	0.5	1.80	1.1

[1] 24 hour maximum
[2] 99.79th percentile of 1 hour means
[3] 90.41st percentile of 24 hour means
[4] 99.9th percentile of 15 minute means
[5] 99.73rd percentile of 1 hour means
[6] 99.18th percentile of 24 hour means
[7] 1 hour average
[8] Maximum daily running 8-hour mean

From the table above the emissions of the following substances can still be considered insignificant, in that the PC is still <10% of the short-term ES; PM_{10}, SO_2 (24 hour mean), HCl and HF.

Also from the table above emissions of the following emissions (which were not screened out as insignificant) have been assessed as being unlikely to give rise to significant pollution in that the predicted environmental concentration is less than 100% of short term ES; NO_2 and SO_2 (15 minute and 1 hour mean).

We are therefore satisfied that it is not necessary to further constrain the conditions and duration of the periods of abnormal operation beyond those permitted under Chapter IV of the IED.

We have not assessed the impact of abnormal operations against long term ESs for the reasons set out above. Except that if dioxin emissions were at 10 ng/m^3 for the maximum period of abnormal operation, this would result in an increase of approximately 67.81% in the TDI reported in section 5.3.2. In these circumstances the TDI would be 0.123 pg(I-TEQ/ kg-BW/day), which is 6.2% of the COT TDI. At this level, emissions of dioxins will still not pose a risk to human health.

6. Application of Best Available Techniques

6.1. Scope of Consideration

In this section, we explain how we have determined whether the Applicant's proposals are the Best Available Techniques for this Installation.

- The first issue we address is the fundamental choice of incineration technology. There are a number of alternatives, and the Applicant has explained why it has chosen one particular kind for this Installation.
- We then consider in particular control measures for the emissions which were not screened out as insignificant in the previous section on minimising the installation's environmental impact. They are: As, NO_2, PAH (using 0.25 ng/m3), Cd, Pb, Cr III, Cr VI , Co, Mn and Ni.
- We also have to consider the combustion efficiency and energy utilisation of different design options for the Installation, which are relevant considerations in the determination of BAT for the Installation, including the Global Warming Potential of the different options.
- Finally, the prevention and minimisation of Persistent Organic Pollutants (POPs) must be considered, as we explain below.

Chapter IV of the IED specifies a set of maximum emission limit values. Although these limits are designed to be stringent, and to provide a high level of environmental protection, they do not necessarily reflect what can be achieved by new plant. Article 14(3) of the IED says that BAT Conclusions shall be the reference for setting the permit conditions, so it may be possible and desirable to achieve emissions below the limits referenced in Chapter IV. However BAT Conclusions and a revised BREF for Incineration have not yet been drafted or published, so the existing BREF and Chapter IV of the IED remain relevant.

Even if the Chapter IV limits are appropriate, operational controls complement the emission limits and should generally result in emissions below the maximum allowed; whilst the limits themselves provide headroom to allow for unavoidable process fluctuations. Actual emissions are therefore almost certain to be below emission limits in practice, because any Operator who sought to operate its installation continually at the maximum permitted level would almost inevitably breach those limits regularly, simply by virtue of normal fluctuations in plant performance, resulting in enforcement action (including potentially prosecution) being taken. Assessments based on, say, Chapter IV limits are therefore "worst-case" scenarios.

Should the Installation, once in operation, emit at rates significantly below the limits included in the Permit, we will consider tightening ELVs appropriately. We are, however, satisfied that emissions at the permitted limits would ensure a high level of protection for human health and the environment in any event.

6.1.1. Consideration of Furnace Type

The prime function of the furnace is to achieve maximum combustion of the waste. Chapter IV of the IED requires that the plant (furnace in this context) should be designed to deliver its requirements. The main requirements of Chapter IV in relation to the choice of a furnace are compliance with air emission limits for CO and TOC and achieving a low TOC/LOI level in the bottom ash.

The Waste Incineration BREF elaborates the furnace selection criteria as:

- the use of a furnace (including secondary combustion chamber) dimensions that are large enough to provide for an effective combination of gas residence time and temperature such that combustion reactions may approach completion and result in low and stable CO and TOC emissions to air and low TOC in residues.
- use of a combination of furnace design, operation and waste throughput rate that provides sufficient agitation and residence time of the waste in the furnace at sufficiently high temperatures.
- The use of furnace design that, as far as possible, physically retain the waste within the combustion chamber (e.g. grate bar spacing) to allow its complete combustion.

The BREF also provides a comparison of combustion and thermal treatment technologies and factors affecting their applicability and operational suitability used in EU and for all types of wastes. There is also some information on the comparative costs. The table below has been extracted from the BREF tables. This table is also in line with the Guidance Note "The Incineration of Waste (EPR 5.01)). However, it should not be taken as an exhaustive list nor that all technologies listed have found equal application across Europe.

Overall, any of the furnace technologies listed below would be considered as BAT provided the Applicant has justified it in terms of:

- nature/physical state of the waste and its variability
- proposed plant throughput which may affect the number of incineration lines
- preference and experience of chosen technology including plant availability
- nature and quantity/quality of residues produced.
- emissions to air – usually NOx as the furnace choice could have an effect on the amount of unabated NOx produced
- energy consumption – whole plant, waste preparation, effect on GWP
- Need, if any, for further processing of residues to comply with TOC
- Costs

Summary comparison of thermal treatment technologies (reproduced from the Waste Incineration BREF)

Technique	Key waste characteristics and suitability	Throughput per line	Advantages	Disadvantages / Limitations of use	Bottom Ash Quality	Cost
Moving grate (air-cooled)	– Low to medium heat values (LCV 5 – 16.5 GJ/t) – Municipal and other heterogeneous solid wastes – Can accept a proportion of sewage sludge and/or medical waste with municipal waste – Applied at most modern MSW installations	– 1 to 50 t/h with most projects 5 to 30 t/h. – Most industrial applications not below 2.5 or 3 t/h.	– Widely proven at large scales. – Robust – Low maintenance cost – Long operational history – Can take heterogeneous wastes without special preparation	– Generally not suited to powders, liquids or materials that melt through the grate	TOC 0.5% to 3%	High capacity reduces specific cost per tonne of waste
Moving grate (liquid Cooled)	Same as air-cooled grates except: – LCV 10 – 20 GJ/t	– Same as air-cooled grates	As air-cooled grates but: – higher heat value waste is treatable – better Combustion control possible.	As air-cooled grates but: – risk of grate damage/ leaks – higher complexity	TOC 0.5% to 3%	Slightly higher capital cost than air-cooled
Rotary Kiln	– Can accept liquids and pastes – solid feeds more limited than grate (owing to refractory damage) – often applied to hazardous wastes	– <10 t/h	– Very well proven with broad range of wastes and good burn out even of hazardous wastes	– Throughputs lower than grates	TOC <3%	Higher specific cost due to reduced capacity
Fluid bed - bubbling	– Only finely divided consistent wastes – Limited use for raw MSW – often applied to sludges	– 1 to 10 t/h –	– Good mixing – Fly ashes of good leaching quality	– Careful operation required to avoid clogging bed. – Higher fly ash quantities.	TOC <3%	– FGT cost may be lower. – Costs of waste preparation

Technique	Key waste characteristics and suitability	Throughput per line	Advantages	Disadvantages / Limitations of use	Bottom Ash Quality	Cost
Fluid bed - circulating	– Only finely divided consistent wastes. – Limited use for raw MSW, often applied to sludges/RDF.	– 1 to 20 t/h most used above 10 t/h	– Greater fuel flexibility than BFB – Fly ashes of good leaching quality	– Cyclone required to conserve bed material – Higher fly ash quantities	TOC <3%	– FGT cost may be lower. – Costs of preparation.
Oscillating furnace	– MSW/heterogeneous wastes	– 1 to 10 t/h	– Robust – Low maintenance – Long history – Low NOX level – Low LOI of bottom ash	– higher thermal loss than with grate furnace – LCV under 15 GJ/t	TOC 0.5 to 3%	Similar to other technologies
Pulsed hearth	– Only higher CV waste (LCV >20 GJ/t) – mainly used for clinical wastes	– <7 t/h	– can deal with liquids and powders	– bed agitation may be lower	Dependent on waste type	– Higher specific cost due to reduced capacity
Stepped and static hearths	– Only higher CV waste (LCV >20 GJ/t) – Mainly used for clinical wastes	– No information	– Can deal with liquids and powders	– Bed agitation may be lower	Dependent on waste type	– Higher specific cost due to reduced capacity
Spreader - stoker combustor	– RDF and other particle feeds – poultry manure – wood wastes	– No information	– simple grate construction – less sensitive to particle size than FB	– only for well-defined mono-streams	No information	– No information
Gasification - fixed bed	– mixed plastic wastes – other similar consistent streams – gasification less widely used/proven than incineration	– 1 to 20 t/h	– low leaching residue – good burnout if oxygen blown – syngas available – Reduced oxidation of recyclable metals	– limited waste feed – not full combustion – high skill level – tar in raw gas – less widely proven	– Low leaching bottom ash – good burnout with oxygen	– High operation/ maintenance costs

Technique	Key waste characteristics and suitability	Throughput per line	Advantages	Disadvantages / Limitations of use	Bottom Ash Quality	Cost
Gasification - entrained flow	– mixed plastic wastes – other similar consistent streams – not suited to untreated MSW – gasification less widely used/proven than incineration	– To 10 t/h	– low leaching slag – reduced oxidation of recyclable metals	– limited waste feed – not full combustion – high skill level – less widely proven	– low leaching slag	– High operation/ maintenance costs – pre-treatment costs high
Gasification - fluid bed	– mixed plastic wastes – shredded MSW – shredder residues – sludges – metal rich wastes – other similar consistent streams – less widely used/proven than incineration	– 5 to 20 t/h	– temperatures e.g. for Al recovery – separation of non-combustibles can be combined with ash melting – reduced oxidation of recyclable metals	– limited waste size (<30cm) – tar in raw gas – higher UHV raw gas – less widely proven	– If combined with ash melting chamber ash is vitrified	– Lower than other gasifiers
Pyrolysis	– pre-treated MSW – high metal inert streams – shredder residues/plastics – pyrolysis is less widely – used/proven than – incineration	– ~ 5 t/h (short drum) – 5 to 10 t/h (medium drum)	– no oxidation of metals – no combustion energy for metals/inert – in reactor acid neutralisation possible – syngas available	– limited wastes – process control and engineering critical – high skill req. – not widely proven – need market for syngas	– dependent on process temperature – residue producedrequires further processing e.g. combustion	– High pre-treatment, operation and capital costs

The Applicant has carried out a review of the following candidate furnace types:

- Moving Grate Furnace
- Fluidised Bed
- Advanced thermal treatment (gasification)

The applicant considers that Fluidised Bed Combustion (FBC) has a number of advantages over traditional incineration processes due to many factors:

- High thermal efficiency;
- Easy ash removal system;
- Low temperatures and fast throughput give good reliability;
- Fast process so not so sensitive to large particles;
- Fully automated and thus ensuring safe operation even at extreme temperatures;
- The system can respond rapidly to changes in load demand due to quick establishment of thermal equilibrium between air and fuel particles in the bed;
- The operation of fluidised bed at lower temperatures helps in reducing air pollution;
- There is much less visual impact as FBC facilities tend to be smaller and require shorter exhaust stacks;
- FBC is more suited to pre-sorted or processed waste. Wood fuel will be highly homogeneous and will not contain plastics. As a consequence of this, less flue gas treatment is required.

The Applicant has proposed to use a furnace technology comprising fluidised bed combustion which is identified as being considered BAT in the BREF or TGN for this type of waste feed.

The Applicant proposes to use gas oil as support fuel for start-up, shut down and for the auxiliary burner which is considered to be BAT.

Boiler Design

In accordance with our Technical Guidance Note, EPR 5.01, the Applicant has confirmed that the boiler design will include the following features to minimise the potential for reformation of dioxins within the de-novo synthesis range:

- ensuring that the steam/metal heat transfer surface temperature is a minimum where the exhaust gases are within the de-novo synthesis range;
- design of the boilers using CFD to ensure no pockets of stagnant or low velocity gas;
- boiler passes are progressively decreased in volume so that the gas velocity increases through the boiler; and
- Design of boiler surfaces to prevent boundary layers of slow moving gas.

Any of the options listed in the BREF and summarised in the table above can be BAT. The Applicant has chosen a furnace technique that is listed in the BREF and we are satisfied that the Applicant has provided sufficient justification to show that their technique is BAT. This is not to say that the other techniques could not also be BAT, but that the Applicant has shown that their chosen technique is at least comparable with the other BAT options. We believe that, based on the information gathered by the BREF process, the chosen technology will achieve the requirements of Chapter IV of the IED for the air emission of TOC/CO and the TOC on bottom ash.

6.2. BAT and emissions control

The prime function of flue gas treatment is to reduce the concentration of pollutants in the exhaust gas as far as practicable. The techniques which are described as BAT individually are targeted to remove specific pollutants, but the BREF notes that there is benefit from considering the FGT system as a whole unit. Individual units often interact, providing a primary abatement for some pollutants and an additional effect on others.

The BREF lists the general factors requiring consideration when selecting flue-gas treatment (FGT) systems as:

- type of waste, its composition and variation
- type of combustion process, and its size
- flue-gas flow and temperature

- flue-gas content, size and rate of fluctuations in composition
- target emission limit values
- restrictions on discharge of aqueous effluents
- plume visibility requirements
- land and space availability
- availability and cost of outlets for residues accumulated/recovered
- compatibility with any existing process components (existing plants)
- availability and cost of water and other reagents
- energy supply possibilities (e.g. supply of heat from condensing scrubbers)
- reduction of emissions by primary methods
- release of noise.

Taking these factors into account the Technical Guidance Note points to a range of technologies being BAT subject to circumstances of the Installation.

6.2.1. Particulate Matter

Particulate matter				
Technique	**Advantages**	**Disadvantages**	**Optimisation**	**Defined as BAT in BREF or TGN for:**
Bag / Fabric filters (BF)	– Reliable abatement of particulate matter to below 5mg/m^3	Max temp 250°C	Multiple compartments Bag burst detectors	Most plants
Wet scrubbing	– May reduce acid gases simultaneously .	Not normally BAT. Liquid effluent produced	Require reheat to prevent visible plume and dew point problems.	Where scrubbing required for other pollutants
Ceramic filters	– High temperature applications – Smaller plant.	May “blind” more than fabric filters	-	– Small plant. – High temperature gas cleaning required.
Electrostatic precipitators	– Low pressure gradient. Use with BF may reduce the energy consumption of the induced draft fan.	Not normally BAT.	-	When used with other particulate abatement plant

The Applicant proposes to use fabric filters for the abatement of particulate matter. Fabric filters provide reliable abatement of particulate matter to below 5 mg/m^3 and are BAT for most installations. The Applicant proposes to use multiple compartment filters with burst bag detection to minimise the risk of increased particulate emissions in the event of bag rupture.

Emissions of particulate matter have been previously screened out as insignificant, and so the Environment Agency agrees that the Applicant’s proposed technique is BAT for the installation.

6.2.2. Oxides of Nitrogen

Oxides of Nitrogen : Primary Measures				
Technique	**Advantages**	**Disadvantages**	**Optimisation**	**Defined as BAT in BREF or TGN for:**
Low NOx burners	Reduces NOx at source	-	Start-up, supplementary firing.	Where auxiliary burners required.
Starved air systems	Reduce CO simultaneously.	-	-	Pyrolysis, Gasification systems.
Optimise primary and secondary air injection	-	-	-	All plant.
Flue Gas Recirculation (FGR)	Reduces the consumption of reagents used for secondary NOx control. May increase overall energy recovery	Some applications experience corrosion problems.	-	All plant unless impractical in design (needs to be demonstrated)
Selective catalytic reduction (SCR)	NOx emissions < 70mg/ m^3 Reduces CO, VOC, dioxins	Expensive. Re-heat required – reduces plant efficiency	-	All plant
Selective non-catalytic reduction (SNCR)	NOx emissions typically 150 - 180mg/m^3	Relies on an optimum temperature around 900 °C, and sufficient retention time for reduction May lead to Ammonia slip	Port injection location	All plant unless lower NOx release required for local environmental protection.
Reagent Type: Ammonia	Likely to be BAT Lower nitrous oxide formation	More difficult to handle Narrower temperature window	-	All plant
Reagent Type: Urea	Likely to be BAT	-	-	All plant

The Applicant proposes to implement the following primary measures:

- Optimise primary and secondary air injection – this technique is BAT for all plant.
- Flue gas recirculation – this technique reduces the consumption of reagents for secondary NO_x control and can increase overall energy recovery, although in some applications there can be corrosion problems – the technique is considered BAT for all plant.

There are two recognised techniques for secondary measures to reduce NO_x. These are Selective Catalytic Reduction (SCR) and Selective Non-Catalytic Reduction (SNCR). For each technique, there is a choice of urea or ammonia reagent.

SCR can reduce NO_x levels to below 70 mg/m^3 and can be applied to all plant, it is generally more expensive than SNCR and requires reheating of the waste gas stream which reduces energy efficiency, periodic replacement of the catalysts also produces a hazardous waste. SNCR can typically reduce NO_x levels to between 150 and 180 mg/m^3, it relies on an optimum temperature of around 900 °C and sufficient retention time for reduction. SNCR is more likely to have higher levels of ammonia slip. The technique can be applied to all plant unless lower NO_x releases are required for local environmental protection. Urea or ammonia can be used as the reagent with either technique, urea is somewhat easier to handle than ammonia and has a wider operating temperature window, but tends to result in higher emissions of N_2O. Either reagent is BAT and the use of one over the other is not normally significant in environmental terms.

Emissions of NOx cannot be screened out as insignificant. However, we are satisfied that the use of SNCR is BAT for the abatement of NOx emissions resulting from the operation of the incinerator plant. This is on the basis of the higher energy consumption associated with SCR abatement plant relative to SNCR plant (8kW/tonne of waste compared to 2kW/tonne), which would reduce the energy efficiency of the facility, the production of additional hazardous wastes resulting from the use of the SCR catalyst, and the higher capital and operating costs associated with SCR abatement systems.

The Applicant proposes to use SNCR with urea as the reagent. Urea has been selected on the basis that it will be safer to handle at the facility than Ammonia, which is corrosive in nature.

The amount of urea used for NOx abatement will need to be optimised to maximise NOx reduction and minimise NH_3 slip. All emissions from the incinerator flue (release points A1) will be monitored using a fully compliant MCERTS accredited Continuous Emissions Monitoring System (CEMS) on the exhaust stack. The NOx measurements will be used to optimise the consumption of reagent by means of a feedback control loop.

The amount of urea used for NO_x abatement will need to be optimised to maximise NO_x reduction and minimise NH_3 slip. Improvement condition IC5 requires the Operator to report to the Environment Agency on optimising the performance of the NO_x abatement system. The Operator is also required to monitor and report on NH_3 and N_2O emissions every 6 months.

6.2.3. Acid Gases, SO_x, HCl and HF

Acid gases and halogens : Primary Measures				
Technique	**Advantages**	**Disadvantages**	**Optimisation**	**Defined as BAT in BREF or TGN for:**
Low sulphur fuel, (< 0.1%S gasoil or natural gas)	Reduces SOx at source	-	Start-up, supplementary firing.	Where auxiliary fuel required.
Management of waste streams	Disperses sources of acid gases (e.g. PVC) through feed.	Requires closer control of waste management	-	All plant with heterogeneous waste feed

Acid gases and halogens : Secondary Measures (BAT is to apply Primary Measures first)				
Technique	**Advantages**	**Disadvantages**	**Optimisation**	**Defined as BAT in BREF or TGN for:**
Wet	– High reaction rates – Low solid residues production – Reagent delivery may be optimised by concentration and flow rate	– Large effluent disposal and water consumption if not fully treated for re-cycle – Effluent treatment plant required – May result in wet plume – Energy required for effluent treatment and plume reheat	-	Plants with high acid gas and metal components in exhaust gas – HWIs
Dry	– Low water use – Reagent consumption may be reduced by recycling in plant – Lower energy use – Higher reliability	– Higher solid residue production – Reagent consumption controlled only by input rate	-	All plant
Semi-dry	– Medium reaction rates – Reagent delivery may be varied by concentration and input rate	– Higher solid waste residues	-	All plant
Reagent Type: Sodium Hydroxide	– Highest removal rates – Low solid waste production	– Corrosive material – ETP sludge for disposal	-	HWIs
Reagent Type: Lime	– Very good removal rates – Low leaching solid residue – Temperature of reaction well suited to use with bag filters	– Corrosive material – May give greater residue volume if no in-plant recycle	Wide range of uses	MWIs, CWIs
Reagent Type: Sodium Bicarbonate	– Good removal rates – Easiest to handle – Dry recycle systems proven	– Efficient temperature range may be at upper end for use with bag filters – Leachable solid residues – Bicarbonate more expensive	Not proven at large plant	CWIs

The Applicant proposes to implement the following primary measures:

- Use of low sulphur fuels for start-up and auxiliary burners – gas should be used if available, where fuel oil is used, this will be low sulphur (i.e. <0.1%), this will reduce SO_x at source.
- Management of heterogeneous wastes – this will disperse problem wastes such as PVC by ensuring a homogeneous waste feed.

There are three recognised techniques for secondary measures to reduce acid gases. These are wet, dry and semi-dry. Wet scrubbing produces an effluent for treatment and disposal in compliance with Article 46(3) of IED. It will also require reheat of the exhaust to avoid a visible plume. Wet scrubbing is unlikely to be BAT except where there are high acid gas and metal components in the exhaust gas as may be the case for some hazardous waste incinerators. In this case, the Applicant does not propose using wet scrubbing, and the Environment Agency agrees that wet scrubbing is not appropriate in this case.

The Applicant has therefore considered dry and semi-dry methods of secondary measures for acid gas abatement. Either can be BAT for this type of facility.

Both dry and semi-dry methods rely on the dosing of powdered materials into the exhaust gas stream. Semi-dry systems (i.e. hydrated reagent) offer reduced material consumption through faster reaction rates, but reagent recycling in dry systems can offset this.

In both dry and semi-dry systems, the injected powdered reagent reacts with the acid gases and is removed from the gas stream by the bag filter system. The powdered materials are either lime or sodium bicarbonate. Both are effective at reducing acid gases, and dosing rates can be controlled from continuously monitoring acid gas emissions. The decision on which reagent to use is normally economic. Lime produces a lower leaching solid residue in the APC residues than sodium bicarbonate and the reaction temperature is well suited to bag filters, it tends to be lower cost, but it is a corrosive material and can generate a greater volume of solid waste residues than sodium bicarbonate. Either reagent is BAT, and the use of one over the other is not significant in environmental terms in this case.

In this case, the Applicant proposes to use a dry system. The Environment Agency is satisfied that this is BAT

6.2.4. Carbon monoxide and volatile organic compounds (VOCs)

The prevention and minimisation of emissions of carbon monoxide and volatile organic compounds is through the optimisation of combustion controls, where all measures will increase the oxidation of these species.

Carbon monoxide and volatile organic compounds (VOCs)				
Technique	**Advantages**	**Disadvantages**	**Optimisation**	**Defined as BAT in BREF or TGN for:**
Optimise combustion control	All measures will increase oxidation of these species.		Covered in section on furnace selection	All plants

6.2.5. Dioxins and furans (and Other POPs)

Dioxins and furans				
Technique	**Advantages**	**Disadvantages**	**Optimisation**	**Defined as BAT in BREF or TGN for:**
Optimise combustion control	All measures will increase oxidation of these species.		Covered in section on furnace selection	All plants

Avoid de novo synthesis			Covered in boiler design	All plant
Effective Particulate matter removal			Covered in section on particulate matter	All plant
Activated Carbon injection	Can be combined with acid gas absorber or fed separately.	Combined feed rate usually controlled by acid gas content.		All plant. Separate feed normally BAT unless feed is constant and acid gas control also controls dioxin release.

The prevention and minimisation of emissions of dioxins and furans is achieved through:

- optimisation of combustion control including the maintenance of permit conditions on combustion temperature and residence time, which has been considered in 6.1.1 above;
- avoidance of de novo synthesis, which has been covered in the consideration of boiler design;
- the effective removal of particulate matter, which has been considered in 6.2.1 above;
- injection of activated carbon. This can be combined with the acid gas reagent or dosed separately. Where the feed is combined, the combined feed rate will be controlled by the acid gas concentration in the exhaust. Therefore, separate feed of activated carbon would normally be considered BAT unless the feed was relatively constant. Effective control of acid gas emissions also assists in the control of dioxin releases.

In this case the Applicant proposes separate feed and we are satisfied their proposals are BAT.

6.2.6. Metals

Metals				
Technique	**Advantages**	**Disadvantages**	**Optimisation**	**Defined as BAT in BREF or TGN for:**
Effective Particulate matter removal			Covered in section on particulate matter	All plant
Activated Carbon injection for mercury recovery	Can be combined with acid gas absorber or fed separately.	Combined feed rate usually controlled by acid gas content.		All plant. Separate feed normally BAT unless feed is constant and acid gas control also controls dioxin release.

The prevention and minimisation of metal emissions is achieved through the effective removal of particulate matter, and this has been considered in 6.2.1 above.

Unlike other metals however, mercury if present will be in the vapour phase. BAT for mercury removal is also dosing of activated carbon into the exhaust gas stream. This can be combined with the acid gas reagent or dosed separately. Where the feed is combined, the combined feed rate will be controlled by the acid gas concentration in the exhaust. Therefore, separate feed of activated carbon would normally be considered BAT unless the feed was relatively constant.

In this case the Applicant proposes separate feed and we are satisfied their proposals are BAT.

6.3. BAT and global warming potential

This section summarises the assessment of greenhouse gas impacts which has been made in the determination of this Permit. Emissions of carbon dioxide (CO_2) and other greenhouse gases differ from those of other pollutants in that, except at gross levels, they have no localised environmental impact. Their impact is at a global level and in terms of climate change. Nonetheless, CO_2 is clearly a pollutant for IED purposes.

The principal greenhouse gas emitted is CO_2, but the plant also emits small amounts of N_2O arising from the operation of secondary NO_x abatement. N_2O has a global warming potential 310 times that of CO_2. The Applicant will therefore be required to optimise the performance of the secondary NO_x abatement system to ensure its GWP impact is minimised.

The major source of greenhouse gas emissions from the installation is however CO_2 from the combustion of waste. There will also be CO_2 emissions from the burning of support fuels at start up, shut down and should it be necessary to maintain combustion temperatures. BAT for greenhouse gas emissions is to maximise energy recovery and efficiency.

The electricity that is generated by the Installation will displace emissions of CO_2 elsewhere in the UK, as virgin fossil fuels will not be burnt to create the same electricity.

The Installation is not subject to the Greenhouse Gas Emissions Trading Scheme Regulations 2012 therefore it is a requirement of IED to investigate how emissions of greenhouse gases emitted from the installation might be prevented or minimised.

Factors influencing GWP and CO_2 emissions from the Installation are:
On the debit side

- CO_2 emissions from the burning of the waste;
- CO_2 emissions from burning auxiliary or supplementary fuels;
- CO_2 emissions associated with electrical energy used;
- N_2O from the de-NOx process.

On the credit side

- CO_2 saved from the export of electricity to the public supply by displacement of burning of virgin fuels;

The GWP of the plant will be dominated by the emissions of carbon dioxide that are released as a result of waste combustion. This will be constant for all options considered in the BAT assessment. Any differences in the GWP of the options in the BAT appraisal will therefore arise from small differences in energy recovery and in the amount of N_2O emitted.

The Applicant considered energy efficiency and compared SCR to SNCR in its BAT assessment. This is set out in sections 4.3.7, 6.1.1 and 6.2.2 of this decision document.

Note: avoidance of methane which would be formed if the waste was landfilled has not been included in this assessment. If it were included due to its avoidance it would be included on the credit side. Ammonia has no direct GWP effect.

Taking all these factors into account, the Operator's assessment shows their preferred option is best in terms of GWP.

The Environment Agency agrees with this assessment and that the chosen option is BAT for the installation.

6.4. BAT and POPs

International action on Persistent Organic pollutants (POPs) is required under the UN's Stockholm Convention, which entered into force in 2004. The EU implemented the Convention through the POPs Regulation (850/2004), which is directly applicable in UK law. The Environment Agency is

required by national POPs Regulations (SI 2007 No 3106) to give effect to Article 6(3) of the EC POPs Regulation when determining applications for environmental Permits.

However, it needs to be borne in mind that this application is for a particular type of installation, namely a waste co-incinerator. The Stockholm Convention distinguishes between intentionally-produced and unintentionally-produced POPs. Intentionally-produced POPs are those used deliberately (mainly in the past) in agriculture (primarily as pesticides) and industry. Those intentionally-produced POPs are not relevant where waste incineration is concerned, as in fact high-temperature incineration is one of the prescribed methods for destroying POPs.

The unintentionally-produced POPs addressed by the Convention are:
- dioxins and furans;
- HCB (hexachlorobenzene)
- PCBs (polychlorobiphenyls) and
- PeCB (pentachlorobenzene)

The UK's national implementation plan for the Stockholm Convention, published in 2007, makes explicit that the relevant controls for unintentionally-produced POPs, such as might be produced by waste incineration, are delivered through the requirements of IED. That would include an examination of BAT, including potential alternative techniques, with a view to preventing or minimising harmful emissions. These have been applied as explained in this document, which explicitly addresses alternative techniques and BAT for the minimisation of emissions of dioxins.

Our legal obligation, under regulation 4(b) of the POPs Regulations, is, when considering an application for an environmental permit, to comply with article 6(3) of the POPs Regulation:

> "Member States shall, when considering proposals to construct new facilities or significantly to modify existing facilities using processes that release chemicals listed in Annex III, without prejudice to Council Directive 1996/61/EC, give priority consideration to alternative processes, techniques or practices that have similar usefulness but which avoid the formation and release of substances listed in Annex III."

The 1998 Protocol to the Convention recommended that unintentionally produced should be controlled by imposing emission limits (e.g 0.1 ng/m^3 for MWIs) and using BAT for incineration. UN Economic Commission for Europe (Executive Body for the Convention) (ECE-EB) produced BAT guidance for the parties to the Convention in 2009. This document considers various control techniques and concludes that primary measures involving management of feed material by reducing halogenated substances are not technically effective. This is not surprising because halogenated wastes still need to be disposed of and because POPs can be generated from relatively low concentrations of halogens. In summary, the successful control techniques for waste incinerators listed in the ECE-EB BAT are:

- maintaining furnace temperature of 850^{o}C and a combustion gas residence time of at least 2 seconds
- rapid cooling of flue gases to avoid the *de novo* reformation temperature range of 250-450^{o}C
- use of bag filters and the injection of activated carbon or coke to adsorb residual POPs components.

Using the methods listed above, the UN-ECE BAT document concludes that incinerators can achieve an emission concentration of 0.1 ng TEQ/m^3.

We believe that the Permit ensures that the formation and release of POPs will be prevented or minimised. As we explain above, high-temperature incineration is one of the prescribed methods for destroying POPs. Permit conditions are based on the use of BAT and Chapter IV of IED and incorporate all the above requirements of the UN-ECE BAT guidance and deliver the requirements of the Stockholm Convention in relation to unintentionally produced POPs.

The release of **dioxins and furans** to air is required by the IED to be assessed against the I-TEQ (International Toxic Equivalence) limit of 0.1 ng/m^3. Further development of the understanding of the harm caused by dioxins has resulted in the World Health Organisation (WHO) producing updated

factors to calculate the WHO-TEQ value. Certain **PCBs** have structures which make them behave like dioxins (dioxin-like PCBs), and these also have toxic equivalence factors defined by WHO to make them capable of being considered together with dioxins. The UK's independent health advisory committee, the Committee on Toxicity of Chemicals in Food, Consumer Products and the Environment (COT) has adopted WHO-TEQ values for both dioxins and dioxin-like PCBs in their review of Tolerable Daily Intake (TDI) criteria. The Permit requires that, in addition to the requirements of the IED, the WHO-TEQ values for both dioxins and dioxin-like PCBs should be monitored for reporting purposes, to enable evaluation of exposure to dioxins and dioxin-like PCBs to be made using the revised TDI recommended by COT. The release of dioxin-like PCBs and PAHs is expected to be low where measures have been taken to control dioxin releases. The Permit also requires monitoring of a range of PAHs and dioxin-like PCBs at the same frequency as dioxins are monitored. We have included a requirement to monitor and report against these WHO-TEQ values for dioxins and dioxin-like PCBs and the range of PAHs as listed in the Permit. We are confident that the measures taken to control the release of dioxins will also control the releases of dioxin-like PCBs and PAHs. Section 5.2.1 of this document details the assessment of emissions to air, which includes dioxins and concludes that there will be no adverse effect on human health from either normal or abnormal operation.

Hexachlorobenzene (HCB) is released into the atmosphere as an accidental product from the combustion of coal, waste incineration and certain metal processes. It has also been used as a fungicide, especially for seed treatment although this use has been banned in the UK since 1975. Natural fires and volcanoes may serve as natural sources. Releases of (HCB) are addressed by the European Environment Agency (EEA), which advises that:

> "*due to comparatively low levels in emissions from most (combustion) processes special measures for HCB control are usually not proposed. HCB emissions can be controlled generally like other chlorinated organic compounds in emissions, for instance dioxins/furans and PCBs: regulation of time of combustion, combustion temperature, temperature in cleaning devices, sorbents application for waste gases cleaning etc*." [reference http://www.eea.europa.eu/publications/EMEPCORINAIR4/sources_of_HCB.pdf]

Pentachlorobenzene (PeCB) is another of the POPs list to be considered under incineration. PeCB has been used as a fungicide or flame retardant, there is no data available however on production, recent or past, outside the UN-ECE region. PeCBs can be emitted from the same sources as for PCDD/F: waste incineration, thermal metallurgic processes and combustion plants providing energy. As discussed above, the control techniques described in the UN-ECE BAT guidance and included in the permit, are effective in controlling the emissions of all relevant POPs including PeCB.

We have assessed the control techniques proposed for dioxins by the Applicant and have concluded that they are appropriate for dioxin control. We are confident that these controls are in line with the UN-ECE BAT guidance and will minimise the release of HCB, PCB and PeCB.

We are therefore satisfied that the substantive requirements of the Convention and the POPs Regulation have been addressed and complied with.

6.5. Other Emissions to the Environment

6.5.1. Emissions to water

Based upon the information in the application we are satisfied that appropriate measures will be in place to prevent and /or minimise emissions to water.

6.5.2. Fugitive emissions

The IED specifies that plants must be able to demonstrate that the plant is designed in such a way as to prevent the unauthorised and accidental release of polluting substances into soil, surface water and groundwater. In addition storage requirements for waste and for contaminated water of Article 46(5) must be arranged.

There is a surface water run-off lagoon in which uncontaminated water is collected and discharged to surface water. The lagoon is located under the site boundary of permit EPR/ZP3237YL, the Operator of this permit controls the release of water from the installation as a whole.

Based upon the information in the application we are satisfied that appropriate measures will be in place to prevent and /or minimise fugitive emissions.

6.5.3. Odour

Odorous waste is unlikely to be accepted on site. Checks will be made in line with acceptance procedures to identify, return or quarantine such waste.

Based upon the information in the application we are satisfied that the appropriate measures will be in place to prevent or where that is not practicable to minimise odour and to prevent pollution from odour.

6.5.4. Noise and vibration

Attenuators, insulation, silencers, lagging and acoustic enclosures are some of the measures included in the Applicant's proposals. Appendix E of the noise assessment provides further details of this.

Based upon the information in the application we are satisfied that the appropriate measures will be in place to prevent or where that is not practicable to minimise noise and vibration and to prevent pollution from noise and vibration outside the site.

The application contained a noise impact assessment (incorporating both the biomass energy plant and the adjacent waste water treatment plant) which identified local noise-sensitive receptors, potential sources of noise at the proposed plant and noise attenuation measures. Measurements were taken of the prevailing ambient noise levels to produce a baseline noise survey and an assessment was carried out in accordance with BS 4142:2014 to compare the predicted plant rating noise levels with the established background levels.

We have undertaken, among others, the following sensitivity tests on the assessment:

- Height of HGV line source and weighbridge point source
- Internal reverberant sound pressure calculations using dimensions in report and Cadna model
- Specific roller shutter door SRI on south east façade on Fuel Hall
- Fuel Hall obstacle absorption coefficient of 0.1
- 'No HGV screening' and a 'floating HGV screen' (0.5 m above the ground) at HGV pump waste water pumping station
- Receptor height
- Ground absorption

Given the context of the operation, the existing background noise sources and our conservative sensitivity modelling checks, we consider the developments are unlikely to have an 'adverse' impact and that the impacts are acceptable. This is subject to the plant and equipment achieving the sound levels proposed with the level of attenuation specified in the Applicant's assessment.

6.6. Setting ELVs and other Permit conditions

6.6.1. Translating BAT into Permit conditions

Article 14(3) of IED states that BAT conclusions shall be the reference for permit conditions. Article 15(3) further requires that under normal operating conditions; emissions do not exceed the emission levels associated with the best available techniques as laid down in the decisions on BAT conclusions.

At the time of writing of this document, no BAT conclusions have been published for waste incineration or co-incineration.

The use of IED Chapter IV emission limits for air dispersion modelling sets the worst case scenario. If this shows emissions are insignificant then we have accepted that the Applicant's proposals are BAT, and that there is no justification to reduce ELVs below the Chapter IV limits in these circumstances.

Below we consider whether, for those emission not screened out as insignificant, different conditions are required as a result of consideration of local or other factors, so that no significant pollution is caused (Article 11(c)) or to comply with environmental quality standards (Article 18).

(i) Local factors

We have considered the information submitted by the Applicant with respect to the nearby residential properties and local wildlife sites. The impact of the proposed Installation on these features is not significant.

(ii) National and European ESs

There are no additional National and European EQS (including Article 18) that need to be considered other than the limits in Chapter IV of the IED to protect the local environment.

(iii) Global Warming

CO_2 is an inevitable product of the combustion of waste. The amount of CO_2 emitted will be essentially determined by the quantity and characteristics of waste being incinerated, which are already subject to conditions in the Permit. It is therefore inappropriate to set an emission limit value for CO_2, which could do no more than recognise what is going to be emitted. The gas is not therefore targeted as a key pollutant under Annex II of IED, which lists the main polluting substances that are to be considered when setting emission limit values (ELVs) in Permits.

We have therefore considered setting equivalent parameters or technical measures for CO_2. However, provided energy is recovered efficiently (see section 4.3.7 above), there are no additional equivalent technical measures (beyond those relating to the quantity and characteristics of the waste) that can be imposed that do not run counter to the primary purpose of the plant, which is the recovery of energy from waste. Controls in the form of restrictions on the volume and type of waste that can be accepted at the Installation and permit conditions relating to energy efficiency effectively apply equivalent technical measures to limit CO_2 emissions.

(iv) Commissioning

The proposed Installation will undergo a period of commissioning before the plant becomes fully operational. The IED and the conditions set out in the permit cover activities at the Installation once it is fully operational – receiving wastes for pre-treatment, biological treatment, paper pulp activity, burning waste and providing electricity to the grid. Prior to commissioning of each regulated activity in Table S1.1 of the Permit, the Applicant shall submit a commissioning plan (required under pre-operational condition 3) to the Environment Agency for approval outlining the expected emissions during different stages of commissioning, the expected duration and timeline for completion of activities and any necessary action to protect the environment in the event that actual emissions exceed expected emissions.

It is recognised that certain information provided in the Application is based upon design data or data from similarly designed operational plant. The commissioning stage provides an early opportunity to verify much of this information and the following points will be verified by the Applicant:

- A commissioning plan to be agreed with the Environment Agency (required under pre-operational condition 3).

- Development of procedures to demonstrate process control of expected emissions under different operating conditions; plant operation conforms to conditions set out in the Permit (required under improvement condition 2).
- Abatement plant optimisation (required under improvement condition 5).
- Calibration of CEMs equipment (required under improvement condition 7).
- Verification of combustion chamber residence times, temperature and oxygen content (required under improvement condition 4 and pre-operational condition 4).

6.7. Monitoring

6.7.1. Monitoring during normal operations

We have decided that monitoring should be carried out for the parameters listed in Schedule 3 using the methods and to the frequencies specified in those tables. These monitoring requirements have been imposed in order to demonstrate compliance with emission limit values and to enable correction of measured concentration of substances to the appropriate reference conditions; to gather information about the performance of the SNCR system; to establish data on the release of dioxin-like PCBs and PAHs from the incineration process and to deliver the requirements of Chapter IV of IED for monitoring of residues and temperature in the combustion chamber.

For emissions to air, the methods for continuous and periodic monitoring are in accordance with the Environment Agency's Guidance M2 for monitoring of stack emissions to air.

Based on the information in the Application and the requirements set in the conditions of the permit we are satisfied that the Operator's techniques, personnel and equipment will have either MCERTS certification or MCERTS accreditation as appropriate.

6.7.2. Monitoring under abnormal operations arising from the failure of the installed CEMs

The Operator has stated that they will provide back-up CEMS working in parallel to the operating CEMS. These will be switched into full operation immediately in the event that there is any failure in the regular monitoring equipment. The back-up CEMS measure the same parameters as the operating CEMS. In the unlikely event that the back-up CEMS also fail Condition 2.3.10 of the permit requires that the abnormal operating conditions apply.

6.7.3. Continuous emissions monitoring for dioxins and heavy metals

Chapter IV of IED specifies manual extractive sampling for heavy metals and dioxin monitoring. However, Article 48(5) of the IED enables The Commission to act through delegated, authority to set the date from which continuous measurements of the air emission limit values for heavy metals, dioxins and furans shall be carried out, as soon as appropriate measurement techniques are available within the Community. No such decision has yet been made by the Commission.

The Environment Agency has reviewed the applicability of continuous sampling and monitoring techniques to the installation.

Recent advances in mercury monitoring techniques have allowed standards to be developed for continuous mercury monitoring, including both vapour-phase and particulate mercury. There is a standard which can apply to CEMs which measure mercury (EN 15267-3) and standards to certify CEMs for mercury, which are EN 15267-1 and EN 15267-3. Furthermore, there is an MCERTS-certified CEM which has been used in trials in the UK and which has been verified on-site using many parallel reference tests as specified using the steps outlined in EN 14181.

In the case of dioxins, equipment is available for taking a sample for an extended period (several weeks), but the sample must then be analysed in the conventional way. A CEN committee has agreed Technical Specifications (EN TS 1948-5) for continuous sampling of dioxins. This specification will lead to a CEN standard following a validation exercise which is currently underway. According to IED Article 48(5), "As soon as appropriate measurement techniques are available within the Union, the Commission shall, by means of delegated acts in accordance with Article 76 and subject to the conditions laid down in Articles 77 and 78, set the date from which continuous measurements of

emissions into the air of heavy metals and dioxins and furans are to be carried out. This is yet to happen. However, our extant 'dioxin enforcement policy' recommends continuous sampling of dioxins where multiple emission exceedances occur and no clear root cause can be identified. Therefore should continuous sampling be required at a later date during the operation of the installation, then sampling and analysis shall comply with the requirements of EN TS 1948

For either continuous monitoring of mercury or continuous sampling of dioxins to be used for regulatory purposes, an emission limit value would need to be devised which is applicable to continuous monitoring. Such limits for mercury and dioxins have not been set by the European Commission. Use of a manual sample train is the only technique which fulfils the requirements of the IED. At the present time, it is considered that in view of the predicted low levels of mercury and dioxin emission it is not justifiable to require the Operator to install additionally continuous monitoring or sampling devices for these substances.

In accordance with its legal requirement to do so, the Environment Agency reviews the development of new methods and standards and their performance in industrial applications. In particular the Environment Agency considers continuous sampling systems for dioxins to have promise as a potential means of improving process control and obtaining more accurate mass emission estimates.

6.8. Reporting

We have specified the reporting requirements in Schedule 5 of the Permit either to meet the reporting requirements set out in the IED, or to ensure data is reported to enable timely review by the Environment Agency to ensure compliance with permit conditions and to monitor the efficiency of material use and energy recovery at the installation.

7. Other legal requirements

In this section we explain how we have addressed other relevant legal requirements, to the extent that we have not addressed them elsewhere in this document.

7.1. The EPR 2016 and related Directives

The EPR delivers the requirements of a number of European and national laws.

7.1.1. Schedules 1 and 7 to the EPR 2016 – IED

We address the requirements of the IED in the body of this document above and the specific requirements of Chapter IV in Annex 1 of this document.

There is one requirement not addressed above, which is that contained in Article 5(3) IED. Article 5(3) requires that "In the case of a new installation or a substantial change where Article 4 of Directive 85/337/EC (now Directive 2011/92/EU) (the EIA Directive) applies, any relevant information obtained or conclusion arrived at pursuant to articles 5, 6 and 7 of that Directive shall be examined and used for the purposes of granting the permit."

- Article 5 of EIA Directive relates to the obligation on developers to supply the information set out in Annex IV of the Directive when making an application for development consent.
- Article 6(1) requires Member States to ensure that the authorities likely to be concerned by a development by reason of their specific environmental responsibilities are consulted on the Environmental Statement and the request for development consent.
- Article 6(2)-6(6) makes provision for public consultation on applications for development consent.
- Article 7 relates to projects with transboundary effects and consequential obligations to consult with affected Member States.

The grant or refusal of development consent is a matter for the relevant local planning authority. The Environment Agency's obligation is therefore to examine and use any relevant information obtained or conclusion arrived at by the local planning authorities pursuant to those EIA Directive articles.

In determining the Application we have considered the following documents: -

- The decision of the Solihull Metropolitan Borough Council to grant planning permission on 24/03/2016 (PL/2015/52078/PPFL).
- The response of the Environment Agency to the local planning authority in its role as consultee to the planning process
  - https://publicaccess.solihull.gov.uk/online-applications/files/CAFC8C544D0C4562CD770C371EF34908/PL_2015_52078_PPFL-ENVIRONMENT_AGENCY-463789.rtf.

From consideration of all the documents above, the Environment Agency considers that no additional or different conditions are necessary.

The Environment Agency has also carried out its own consultation on the Environmental Permitting Application which includes the Environmental Statement submitted to the local planning authority. The results of our consultation are described elsewhere in this decision document.

7.1.2. Schedule 9 to the EPR 2016 – Waste Framework Directive

As the Installation involves the treatment of waste, it is carrying out a *waste operation* for the purposes of the EPR 2016, and the requirements of Schedule 9 therefore apply. This means that we must exercise our functions so as to ensure implementation of certain articles of the WFD.

We must exercise our relevant functions for the purposes of ensuring that the waste hierarchy referred to in Article 4 of the Waste Framework Directive is applied to the generation of waste and that any waste generated is treated in accordance with Article 4 of the Waste Framework Directive. (See also section 4.3.9)

The conditions of the permit ensure that waste generation from the facility is minimised. Where the production of waste cannot be prevented it will be recovered wherever possible or otherwise disposed of in a manner that minimises its impact on the environment. This is in accordance with Article 4.

We must also exercise our relevant functions for the purposes of implementing Article 13 of the Waste Framework Directive; ensuring that the requirements in the second paragraph of Article 23(1) of the Waste Framework Directive are met; and ensuring compliance with Articles 18(2)(b), 18(2)(c), 23(3), 23(4) and 35(1) of the Waste Framework Directive.

Article 13 relates to the protection of human health and the environment. These objectives are addressed elsewhere in this document.

Article 23(1) requires the permit to specify:

(a) the types and quantities of waste that may be treated;
(b) for each type of operation permitted, the technical and any other requirements relevant to the site concerned;
(c) the safety and precautionary measures to be taken;
(d) the method to be used for each type of operation;
(e) such monitoring and control operations as may be necessary;
(f) such closure and after-care provisions as may be necessary.

These are all covered by permit conditions.

We consider that the intended method of waste treatment is acceptable from the point of view of environmental protection so Article 23(3) does not apply.

Energy efficiency is dealt with elsewhere in this document but we consider the conditions of the permit ensure that the recovery of energy take place with a high level of energy efficiency in accordance with Article 23(4).

Article 35(1) relates to record keeping and its requirements are delivered through permit conditions.

7.1.3. Schedule 22 to the EPR 2016 – Water Framework and Groundwater Directives

To the extent that it might lead to a discharge of pollutants to groundwater (a "groundwater activity" under the EPR 2016), the Permit is subject to the requirements of Schedule 22, which delivers the requirements of EU Directives relating to pollution of groundwater. The Permit will require the taking of all necessary measures to prevent the input of any hazardous substances to groundwater, and to limit the input of non-hazardous pollutants into groundwater so as to ensure such pollutants do not cause pollution, and satisfies the requirements of Schedule 22.

No releases to groundwater from the Installation are permitted. The Permit also requires material storage areas to be designed and maintained to a high standard to prevent accidental releases.

7.1.4. Directive 2003/35/EC – The Public Participation Directive

Regulation 60 of the EPR 2016 requires the Environment Agency to prepare and publish a statement of its policies for complying with its public participation duties. We have published our public participation statement. This Application has been consulted upon in line with this statement.

7.2. National primary legislation

7.2.1. Environment Act 1995

(i) Section 4 (Pursuit of Sustainable Development)

We are required to contribute towards achieving sustainable development, as considered appropriate by Ministers and set out in guidance issued to us. The Secretary of State for Environment, Food and Rural Affairs has issued *The Environment Agency's Objectives and Contribution to Sustainable Development: Statutory Guidance (December 2002)*. This document:

> "*provides guidance to the Agency on such matters as the formulation of approaches that the Agency should take to its work, decisions about priorities for the Agency and the allocation of resources. It is not directly applicable to individual regulatory decisions of the Agency*".

In respect of regulation of industrial pollution through the EPR, the Guidance refers in particular to the objective of setting permit conditions "*in a consistent and proportionate fashion based on Best Available Techniques and taking into account all relevant matters…*". The Environment Agency considers that it has pursued the objectives set out in the Government's guidance, where relevant, and that there are no additional conditions that should be included in this Permit to take account of the Section 4 duty.

(ii) Section 5 (Preventing or Minimising Effects of Pollution of the Environment)

We are satisfied that our pollution control powers have been exercised for the purpose of preventing or minimising, remedying or mitigating the effects of pollution.

(iii) Section 7 (Pursuit of Conservation Objectives)

This places a duty on us, when considering any proposal relating to our functions, to have regard amongst other things to any effect which the proposals would have on sites of archaeological, architectural, or historic interest; the economic and social well-being of local communities in rural areas; and to take into account any effect which the proposals would have on the beauty or amenity of any rural area.

We considered whether we should impose any additional or different requirements in terms of our duty to have regard to the various conservation objectives set out in Section 7, but concluded that we should not.

(iv) Section 39 (Costs and Benefits)

We have a duty to take into account the likely costs and benefits of our decisions on the applications ('costs' being defined as including costs to the environment as well as any person). This duty, however, does not affect our obligation to discharge any duties imposed upon us in other legislative provisions.

In so far as relevant we consider that the costs that the permit may impose on the applicant are reasonable and proportionate in terms of the benefits it provides.

(v) Section 108 Deregulation Act 2015 – Growth duty

We have considered our duty to have regard to the desirability of promoting economic growth set out in section 108(1) of the Deregulation Act 2015 and the guidance issued under section 110 of that Act in deciding whether to grant this permit.

Paragraph 1.3 of the guidance says:

> "The primary role of regulators, in delivering regulation, is to achieve the regulatory outcomes for which they are responsible. For a number of regulators, these regulatory outcomes include an explicit reference to development or growth. The growth duty establishes economic growth as a factor that all specified regulators should have regard to, alongside the delivery of the protections set out in the relevant legislation."

We have addressed the legislative requirements and environmental standards to be set for this operation in the body of the decision document above. The guidance is clear at paragraph 1.5 that the growth duty does not legitimise non-compliance and its purpose is not to achieve or pursue economic growth at the expense of necessary protections.

We consider the requirements and standards we have set in this permit are reasonable and necessary to avoid a risk of an unacceptable level of pollution. This also promotes growth amongst legitimate operators because the standards applied to the operator are consistent across businesses in this sector and have been set to achieve the required legislative standards.

(vi) Section 81 (National Air Quality Strategy)

We have had regard to the National Air Quality Strategy and consider that our decision complies with the Strategy, and that no additional or different conditions are appropriate for this Permit.

7.2.2. Human Rights Act 1998

We have considered potential interference with rights addressed by the European Convention on Human Rights in reaching our decision and consider that our decision is compatible with our duties under the Human Rights Act 1998. In particular, we have considered the right to life (Article 2), the right to a fair trial (Article 6), the right to respect for private and family life (Article 8) and the right to protection of property (Article 1, First Protocol). We do not believe that Convention rights are engaged in relation to this determination.

7.2.3. Countryside and Rights of Way Act 2000 (CROW 2000)

Section 85 of this Act imposes a duty on Environment Agency to have regard to the purpose of conserving and enhancing the natural beauty of the area of outstanding natural beauty (AONB). There is no AONB which could be affected by the Installation.

7.2.4. Wildlife and Countryside Act 1981

Under section 28G of the Wildlife and Countryside Act 1981 the Environment Agency has a duty to take reasonable steps to further the conservation and enhancement of the flora, fauna or geological or physiographical features by reason of which a site is of special scientific interest. Under section 28I the Environment Agency has a duty to consult Natural England in relation to any permit that is likely to damage SSSIs.

We assessed the Application and concluded that the Installation will not damage the special features of any SSSI. This was recorded on a CROW Appendix 4 form.

The CROW assessment is summarised in greater detail in section 5.4.2 of this document. A copy of the full Appendix 4 Assessment can be found on the public register.

7.2.5. Natural Environment and Rural Communities Act 2006

Section 40 of this Act requires us to have regard, so far as is consistent with the proper exercise of our functions, to the purpose of conserving biodiversity. We have done so and consider that no different or additional conditions in the Permit are required.

7.3. National secondary legislation

7.3.1. The Persistent Organic Pollutants Regulations 2007

We have explained our approach to these Regulations, which give effect to the Stockholm Convention on POPs and the EU's POPs Regulation, above.

ANNEX 1: APPLICATION OF CHAPTER IV OF THE INDUSTRIAL EMISSIONS DIRECTIVE

IED Article	Requirement	Delivered by
45(1)(a)	The permit shall include a list of all types of waste which may be treated using at least the types of waste set out in the European Waste List established by Decision 2000/532/EC, if possible, and containing information on the quantity of each type of waste, where appropriate.	Condition 2.3.4(a) and Table S2.2 in Schedule 2 of the Permit.
45(1)(b)	The permit shall include the total waste incinerating or co-incinerating capacity of the plant.	Condition 2.3.4(a) and Table S2.2 in Schedule 2 of the Permit.
45(1)(c)	The permit shall include the limit values for emissions into air and water.	Conditions 3.1.1 and 3.1.2 and Tables S3.1, S3.1a and S3.2 in Schedule 3 of the Permit.
45(1)(d)	The permit shall include the requirements for pH, temperature and flow of waste water discharges.	Not Applicable
45(1)(e)	The permit shall include the sampling and measurement procedures and frequencies to be used to comply with the conditions set for emissions monitoring.	Condition 3.5 and Tables S3.1, S3.1a, S3.2, S3.3 and S3.4 in Schedule 3 of the Permit.
45(1)(f)	The permit shall include the maximum permissible period of unavoidable stoppages, disturbances or failures of the purification devices or the measurement devices, during which the emissions into the air and the discharges of waste water may exceed the prescribed emission limit values.	Conditions 2.3.10 and 2.3.11.
46(1)	Waste gases shall be discharged in a controlled way by means of a stack the height of which is calculated in such a way as to safeguard human health and the environment.	Condition 2.3.1 and Table S1.2 of Schedule 1 of the Permit.
46(2)	Emission into air shall not exceed the emission limit values set out in parts 4 or determined in accordance with part 4 of Annex VI.	Conditions 3.1.1 and 3.1.2 and Tables S3.1 and S3.1a.
46(3)	Relates to conditions for water discharges from the cleaning of exhaust gases.	There are no such discharges as condition 3.1.1 prohibits this.
46(4)	Relates to conditions for water discharges from the cleaning of exhaust gases.	There are no such discharges as condition 3.1.1 prohibits this.
46(5)	Prevention of unauthorised and accidental release of any polluting substances into soil, surface water or groundwater. Adequate storage capacity for contaminated rainwater run-off from the site or for contaminated water from spillage or fire-fighting.	The application explains the measures to be in place for achieving the directive requirements

IED Article	Requirement	Delivered by
46(6)	Limits the maximum period of operation when an ELV is exceeded to 4 hours uninterrupted duration in any one instance, and with a maximum cumulative limit of 60 hours per year. Limits on dust, CO and TOC not to be exceeded during this period.	Conditions 2.3.10 and 2.3.11
47	In the event of breakdown, reduce or close down operations as soon as practicable. Limits on dust, CO and TOC not to be exceeded during this period.	Condition 2.3.12
48(1)	Monitoring of emissions is carried out in accordance with Parts 6 and 7 of Annex VI.	Condition 3.5. Reference conditions are defined in Schedule 6 of the Permit.
48(2)	Installation and functioning of the automated measurement systems shall be subject to control and to annual surveillance tests as set out in point 1 of Part 6 of Annex VI.	condition 3.5.3, and tables S3.1, S3.1a, and S3.4
48(3)	The competent authority shall determine the location of sampling or measurement points to be used for monitoring of emissions.	conditions 3.5.3 and 3.5.4
48(4)	All monitoring results shall be recorded, processed and presented in such a way as to enable the competent authority to verify compliance with the operating conditions and emission limit values which are included in the permit.	Conditions 4.1.1 and 4.1.2, and Tables S4.1 and S4.4
49	The emission limit values for air and water shall be regarded as being complied with if the conditions described in Part 8 of Annex VI are fulfilled.	conditions 3.1.1 and 3.1.2 and 3.5.5
50(1)	Slag and bottom ash to have Total Organic Carbon (TOC) < 3% or loss on ignition (LOI) < 5%.	Conditions 3.5.1 (c) and Table S3.4
50(2)	Flue gas to be raised to a temperature of 850ºC for two seconds, as measured at representative point of the combustion chamber.	Condition 2.3.7, Pre-operational condition PO4 and Improvement condition IC4 and Table S3.3
50(3)	At least one auxiliary burner which must not be fed with fuels which can cause higher emissions than those resulting from the burning of gas oil, liquefied gas or natural gas.	Condition 2.3.8
50(4)(a)	Automatic shut to prevent waste feed if at start up until the specified temperature has been reached.	Condition 2.3.7
50(4)(b)	Automatic shut to prevent waste feed if the combustion temperature is not maintained.	Condition 2.3.7
50(4)(c)	Automatic shut to prevent waste feed if the CEMs show that ELVs are exceeded due to disturbances or failure of waste cleaning devices.	Condition 2.3.7

IED Article	Requirement	Delivered by
50(5)	Any heat generated from the process shall be recovered as far as practicable.	The plant has been built to generate heat and will provide a smaller amount of electricity
50(6)	Relates to the feeding of infectious clinical waste into the furnace.	No infectious clinical waste will be burnt
50(7)	Management of the Installation to be in the hands of a natural person who is competent to manage it.	Conditions 1.1.1 to 1.1.3 and 2.3.1 of the Permit.
51(1)	Different conditions than those laid down in Article 50(1), (2) and (3) and, as regards the temperature Article 50(4) may be authorised, provided the other requirements of this chapter are met.	No such conditions have been allowed
51(2)	Changes in operating conditions do not cause more residues or residues with a higher content of organic polluting substances compared to those residues which could be expected under the conditions laid down in Articles 50(1), (2) and (3).	No such conditions have been allowed
51(3)	Changes in operating conditions shall include emission limit values for CO and TOC set out in Part 3 of Annex VI.	No such conditions have been allowed
52(1)	Take all necessary precautions concerning delivery and reception of Wastes, to prevent or minimise pollution.	Conditions 2.3.1, 2.3.3, 3.2, 3.3, 3.4 and 3.6.
52(2)	Determine the mass of each category of wastes, if possible according to the EWC, prior to accepting the waste.	Condition 2.3.4(a) and Table S2.2 in Schedule 3 of the Permit.
53(1)	Residues to be minimised in their amount and harmfulness, and recycled where appropriate.	Conditions 1.4.1, 1.4.2 and 3.5.1 with Table S3.4
53(2)	Prevent dispersal of dry residues and dust during transport and storage.	Conditions 1.4.1 2.3.1, 2.3.2 and 3.2.1.
53(3)	Test residues for their physical and chemical characteristics and polluting potential including heavy metal content (soluble fraction).	Condition 3.5.1 (c) and Table S3.4 and pre-operational condition PO2.
55(1)	Application, decision and permit to be publicly available.	All documents are accessible from the Environment Agency Public Register.
55(2)	An annual report on plant operation and monitoring for all plants burning more than 2 tonne/hour waste.	Condition 4.2.2 and 4.2.3.

ANNEX 2: Pre-Operational Conditions

Based on the information on the Application, we consider that we do need to impose pre-operational conditions. These conditions are set out below and referred to, where applicable, in the text of the decision document. We are using these conditions to require the Operator to confirm that the details and measures proposed in the Application have been adopted or implemented prior to the operation of the Installation.

Reference	Pre-operational measures
PO1 (EMS)	Prior to the commencement of commissioning, the Operator shall send a summary of the site Environment Management System (EMS) to the Environment Agency and make available for inspection all documents and procedures which form part of the EMS. The EMS shall be developed in line with the requirements set out in Environment Agency web guide on developing a management system for environmental permits (link). The documents and procedures set out in the EMS shall form the written management system referenced in condition 1.1.1 (a) of the permit.
PO2 (testing protocol)	Prior to the commencement of commissioning, the Operator shall submit to the Environment Agency for approval a protocol for the sampling and testing of incinerator bottom ash for the purposes of assessing its hazard status. Sampling and testing shall be carried out in accordance with the protocol as approved.
PO3 (commissioning plan)	At least two months before the commencement of commissioning, the Operator shall provide a written commissioning plan, including timelines for completion, for approval by the Environment Agency. The commissioning plan shall include the expected emissions to the environment during the different stages 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. Commissioning shall be carried out in accordance with the commissioning plan as approved.
PO4 (CFD)	After completion of furnace design and at least three calendar months before commencement of commissioning; the operator shall submit a written report to the Agency of the details of the computational fluid dynamic (CFD) modelling. The report shall demonstrate whether the design combustion conditions comply with the residence time and temperature requirements as defined by Chapter IV and Annex VI of the IED.
PO5 (soils and groundwater monitoring)	The Operator shall submit the written protocol referenced in condition 3.2.4 for the monitoring of soil and groundwater for approval by the Environment Agency. The protocol shall demonstrate how the Operator will meet the requirements of Articles 14(1)(b), 14(1)(e) and 16(2) of the IED. The procedure shall be implemented in accordance with the written approval from the Agency.
PO6 (monitoring)	At least three months before the commencement of commissioning, the Operator shall submit a written report to the Environment Agency specifying arrangements for continuous and periodic monitoring of emissions to air to comply with Environment Agency guidance notes M1 and M2. The report shall include the following: • Plant and equipment details, including accreditation to MCERTS • Methods and standards for sampling and analysis • Details of monitoring locations, access and working platforms

Reference	Pre-operational measures
PO7 (fire prevention plan)	The Operator shall submit evidence to show that the design, installation and maintenance of the in building detection and suppressions systems will be covered by an appropriate UKAS accredited third party certification scheme or a demonstrable alternative third party accreditation.

ANNEX 3: Improvement Conditions

Based in the information in the Application we consider that we need to set improvement conditions. These conditions are set out below - justifications for these is provided at the relevant section of the decision document. We are using these conditions to require the Operator to provide the Environment Agency with details that need to be established or confirmed during and/or after commissioning.

Reference	Requirement	Date
IC1 (Size distribution of PM)	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 point [A1], 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.
IC2 (Performance against design)	The Operator shall submit a written report to the Environment Agency on the commissioning of the installation. The report shall summarise the environmental performance of the plant as installed against the design parameters set out in the Application. 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.
IC3 (furnace parameters)	The Operator shall carry out checks to verify the residence time, minimum temperature and oxygen content of the exhaust gases in the furnace whilst operating under the anticipated most unfavourable operating conditions to demonstrate whether the requirements of Chapter IV and Annex VI of the IED are met. The results shall be submitted in writing to the Environment Agency and include a comparison with the CFD modelling submitted with PO4.	Within 4 months of the completion of commissioning.
IC4 (Optimisation of reagent dosing)	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 (NOx).The report shall include an assessment of the level of NOx, N_2O and NH_3 emissions that can be achieved under optimum operating conditions. • The sodium bicarbonate injection system for minimisation of acid gas emissions • The carbon injection system for minimisation of dioxin and heavy metal emissions.	Within 4 months of the completion of commissioning.

Reference	Requirement	Date
IC5 (Metal monitoring)	The Operator shall carry out an assessment of the impact of emissions to air of As and Cr VI. 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 EQS/EAL. In the event that the assessment shows that an EQS/EAL can be exceeded, the report shall include proposals for further investigative work.	15 months from the completion of commissioning
IC6 (CEMS calibration)	The Operator shall submit a written summary report to the Environment Agency to confirm by 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.	Initial calibration report to be submitted to the Agency within 3 months of completion of commissioning. Full summary evidence compliance report to be submitted within 18 months of completion of commissioning.

ANNEX 4: Consultation Reponses

Advertising and Consultation on the Application

The Application has been advertised and consulted upon in accordance with the Environment Agency's Public Participation Statement. The way in which this has been carried out along with the results of our consultation and how we have taken consultation responses into account in reaching our draft decision is summarised in this Annex. Copies of all consultation responses have been placed on the Environment Agency public register.

The Application was advertised on the Environment Agency website from 5 February 2018 to 5 March 2018. The Application was made available to view at the Environment Public Register at Solihull.

The following statutory and non-statutory bodies were consulted: -

- West Midlands Fire and Rescue Service
- Health and Safety Executive
- Public Health England - Birmingham
- Director of Public Health - Solihull Metropolitan Borough
- Solihull Metropolitan Borough Council Environmental Health
- Solihull Metropolitan Borough Council Planning
- Food Standards Agency
- National Grid
- Severn Trent Water

Consultation Responses from Statutory and Non-Statutory Bodies

Response Received from West Midlands Fire and Rescue Service, 5 February 2018	
Brief summary of issues raised:	**Summary of action taken/how this has been covered**
No comment	N/A

Response Received from National Grid, 7 February 2018	
Brief summary of issues raised:	**Summary of action taken/how this has been covered**
Operator should liaise with the National Grid to ensure the development does not affect equipment in the area	No action required

Response Received from Public Health England 16 March 2018	
Brief summary of issues raised:	**Summary of action taken/how this has been covered**
Based solely on the information contained in the application provided, PHE has no significant concerns regarding risk to health of the local population from this proposed activity, providing that the applicant takes all appropriate measures to prevent or control pollution, in accordance with the relevant sector technical guidance or industry best practice.	No action required

No other responses were received.

Consultation Responses from Members of the Public

No responses were received from members of the public.